THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

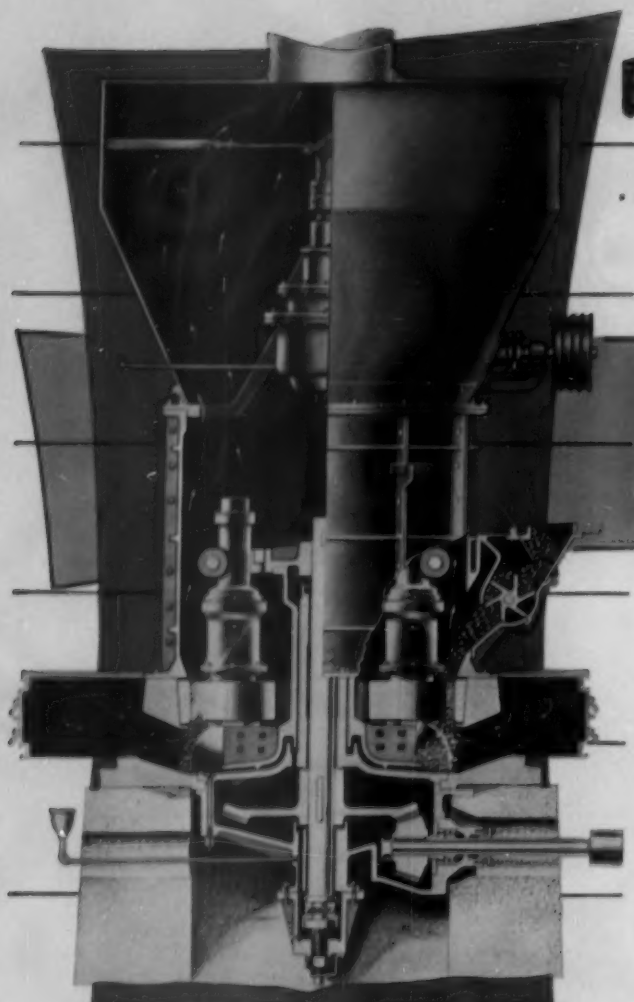
LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

Satellite Gravel Plants
for Service and Economy page 68
Conveyor Generates Current
from Quarry to Cement Mill page 74
Big Fluxstone Quarry
Supplies Steel Companies page 78
Operates Four Plants
and Fifty Mixer Trucks page 152

Camp Dennison plant, Ohio Gravel Co., near Cincinnati, Ohio

Better Fine Grinding...

...How to improve accuracy, uniformity and output at reduced cost



Cross section of Roller Mill showing how material is ground by rolls rotating against bull ring, then air swept to separator which extracts fines and returns coarse material to mill for regrinding.

WILLIAMS Roller Mills

Positive and continuous precision size control at exceptionally high production rates are only two of the superior features of Williams Roller Mills. Instant adjustment for grinding from 20 mesh down to 400 mesh, even to micron sizes, has established the Williams as one of the most versatile of fine grinding mills. Finished products can be maintained at finenesses of 99.9% + passing 325 mesh.

The operation of a Williams Roller Mill is simple, yet performance remains unsurpassed. Positive, self-adjusting feeding and blending of raw materials into the mill is automatic where pulverizing is done by grinding rolls spinning centrifugally against a bull ring. A continual rising current of cool air sweeps upward carrying ground material to the classifier that separates all finished fines from the coarse tailings which are all returned for further grinding.

Rugged construction promises less down time, lower power costs, minimum maintenance. Automatic take-up for wear is continuous.

Find out how easy it is to improve product quality and reduce production costs. Get all the facts about Williams Roller Mills.

Write today for literature.

***TESTING AND RESEARCH LABORATORIES** are at your service to help you solve every size reduction problem. Write for information.*

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
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WILLIAMS COMPLETE PLANTS

Williams builds all types of ready-to-install plants for crushing, grinding and air separation, including storage bins and electrical equipment. Consult the industry's most experienced engineers. Write!

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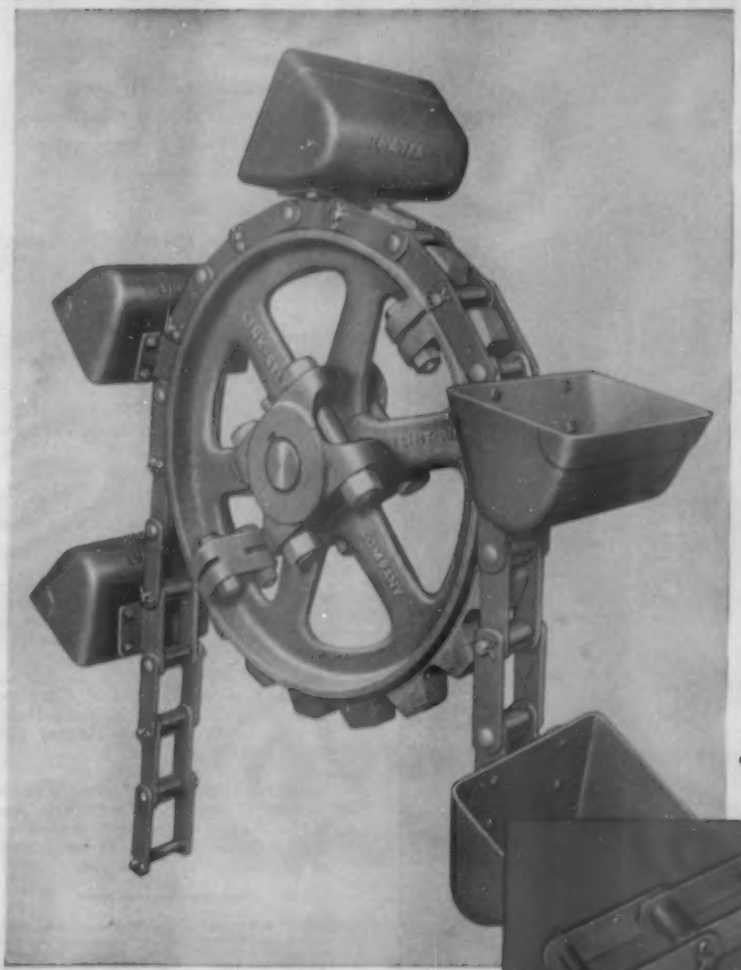
Hammer Mills Helix-Seal Mills Air Separators Vibrating Screens Feeders Impactors

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

4 times the life... 1/4 the maintenance

through proper selection of LINK-BELT *chain*



Bucket elevator at fertilizer plant proves advantage of choosing from this complete line

Often there's no need to go to excessively costly cast special alloy chains to get long life. Here's proof: In an Indianapolis fertilizer plant, Link-Belt SS-111 bushed chain (left) handled an average of 75,000 to 80,000 tons of fertilizer before requiring replacement. The previous type of chain had to be replaced after handling 18,000 tons.

This installation is an example of the efficiency and economy that can be gained by applying the one chain best suited to specific conditions from the complete Link-Belt line. Remember, no other single source offers you such a broad range of roller, silent, cast, combination, forged and fabricated chains . . . with matching sprockets.

A call to your nearby Link-Belt office or authorized stock-carrying distributor will bring you all the facts about the complete line of Link-Belt chains and sprockets.

Under severely corrosive conditions, Link-Belt SS chain on bucket elevator of this type in fertilizer plant handled 80,000 tons, to previous chain's 18,000.

Looking for the *best* chain for a specific need? Link-Belt makes the *complete* line.

LXS steel chain

800 Lay bushed chain

Class C combination chain

"Flint-Rim" cast sprockets

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ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY — LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

November 1955

This Month

What's Happening 19

Editorial—National Slum Clearance Program Will Create Enormous Markets 49

Rocky's Notes—Symposium on Chemistry of Cement—I 51

Labor Relations Trends 53

People in the News 55

Industry News 59

Hints and Helps 62

New Machinery 64

Strategic Location of Gravel Plants Pays Off in Service and Economy 68
Ohio Gravel Co., operating five producing plants in the Cincinnati area, has reclaimed worked-out gravel pits, converting them to recreation parks
Hubert C. Parsons

Long Conveyor from Quarry to Cement Plant Generates Current 74
Oregon Portland Cement Co., Lime, Ore., operates three long conveyor flights with surge piles at transfer points to move stone from quarry at higher elevation to cement plant in valley *Walter S. Lenhart*

Complete New Silica Refractory Plant 77

Operation Fluxstone 78
Presque Isle Corp., Presque Isle, Mich., a joint venture of five major steel companies, has constructed a new $15,000,000 fluxstone plant in northern Michigan
Kenneth A. Gutschick

Industrial Sand Producers Discuss Problems Facing the Industry 89

Use Time Recorders to Check Operation of Equipment 92
Andrew Forrester

Firing Kilns with Fluid Petroleum Coke 98
R. M. Carsforth and E. R. Lee, Jr.

Gas Turbines in Venezuela Cement Plant *L. W. Passmore* 107

Directors Meetings of N.S. & G.A. and N.R.M.C.A. 110

CONCRETE PRODUCTS—

Autoclave Equipped with Special "Blow-Down" Cylinder 149
Graystone, Inc., Seattle, Wash., experimenting with high pressure curing system for both concrete block and pipe *Walter S. Lenhart*

Operate Four Plants—50 Mixer Trucks 152
Anderson-Dunham, Inc., Baton Rouge, La., also makes concrete pipe, and quarries limestone and gypsum
Hubert C. Parsons

Two Types of Precast Slabs Made by Carter-Waters Corporation *Tip Brown* 156

Two-Way Radio on All Mobile Equipment of Ready-Mixed Concrete Co., Inc., Ft. Lauderdale, Fla. 160
Hubert C. Parsons

Thin Section, Precast Concrete Roofs 161

Chemical Resisting Concrete Products *J. Vander Eerde* 166

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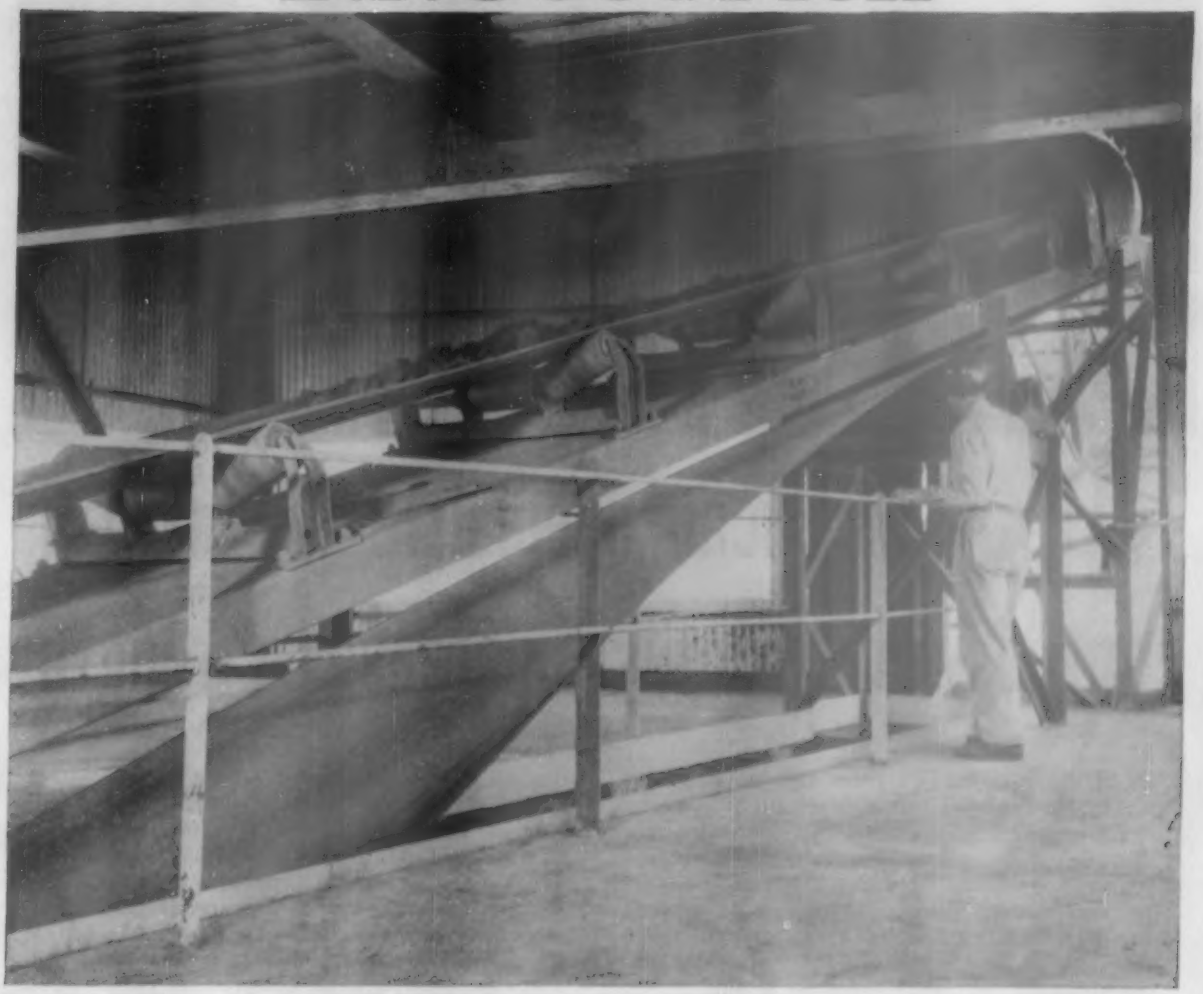

How conveyors stay clean even when load is sticky

THAT stuff riding the conveyor belt is refuse from a coal washing plant on its way to a dumping point—550 feet uphill. When plans were drawn up, engineers said the usual conveyor system wouldn't be the answer here. They knew the wet clay and sticky sand would cling to the belt, build up into gummy layers, clog the return idlers and pulleys, and damage the belt cover.

To avoid this trouble, they installed something quite different in conveyors —the B. F. Goodrich "Turnover" belt system. Here's how it works. As the material is dumped off the end of the moving belt, the belt makes a 180° turn, runs empty along the return idlers, then makes another one-half turn (as shown above) before receiving the next load.

Only the clean side of the belt touches the idlers, so there's no chance for sticky materials to build up on them. Even wet materials can be handled in cold weather without danger of the belt freezing to the rotating metal parts.

With the "Turnover" belt, expensive decking can be eliminated. Clean up of spillage is no problem because any material that falls on the lower run of the belt is carried to the end and dumped off when the belt makes its turn. Damage to belt body is reduced because lumps of materials cannot be trapped between the belt and pulleys.

If you have an operation where sticky, freezing or corrosive materials must be moved from place to place, the B. F. Goodrich "Turnover" conveyor system can save you trouble and money. Your B. F. Goodrich distributor can give you full details and show you how easy it is to convert any conventional system into the turnover type. *The B. F. Goodrich Company, Dept. M-500, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

Prestressed supporting beams were specified for Scotland Road Bridge, just north of Boston, Massachusetts, to provide extra strength and maximum resistance to cracking. After rigorous tests, no beam for this bridge has been rejected.

American Special High Strength speeds construction, increases strength

IN MASSACHUSETTS, seven important new highway bridges are being built with prestressed concrete. One of these is Scotland Road Bridge which will handle the bulk of traffic between Boston and the New Hampshire and Maine turnpikes. Extra strength and durability, as well as exceptional resistance to cracking, were built into this bridge by using prestressed concrete bridge beams reinforced by post-tensioning American High Strength Reinforcing Strand.

The slab road surface rests on 24 prestressed H-beams that were designed and manufactured by New England Concrete Pipe Corporation. Each beam is 66 ft.-4 in. long, 3 ft.-6 in. deep and 1 ft.-6 in. wide at the flanges. It contains three 1 $^{9}/_{16}$", 61-wire American Special High Strength Reinforcing Strands (not strain relieved) that are cut to length at the mill with end fittings attached and are post-tensioned to a final stress of 110,000 psi. by the manufacturer of the beam. This stress is 50% of the strand's ultimate strength . . . and more than 5 times as great as the 20,000 psi. allowed for ordinary concrete reinforcement. Post-tensioning keeps the concrete under compression, prevents destructive cracking, reduces maintenance, and increases the useful life of the concrete. The 24 beams for Scotland Road Bridge were installed in just 7 hours.

Beams were prefabricated at Boston, then trucked to the job. All 24 beams were placed in just 7 hours with 2 mobile cranes.

Each of the beams in this prestressed concrete bridge at Glen Iron, Pennsylvania contains eighty ¼-in American Special High Strength Reinforcing Strands. The beams for all 5 spans were erected in less than 6 days.

Reinforcing Strand of Prestressed concrete bridges

IN PENNSYLVANIA, more than 125 concrete highway bridges have been built with Pretensioned-Prestressed Concrete Bridge Members manufactured by Concrete Products Co. of America, Division of American Marietta Co. These extra strong bridge members all are reinforced with American Special High Strength Reinforcing Strand regular grade (not strain relieved).

The largest of these bridges, shown above, was erected in 1952 at Glen Iron, Pa. It contains 45 Pretensioned-Prestressed Members that are reinforced with ¼" diameter American Special High Strength Reinforcing Strand. Each beam is 53 ft. long, 3 ft. wide, and 33 inches deep.

These pretensioned bridge beams require only about one-fourth as much steel as conventional reinforced concrete bridge members; they resist cracking better; yet they cost about *25% less,* installed, than conventional members of equivalent strength. In tests, these pretensioned beams withstand loads 3 times greater than those required by Standard Specifications for Highway Bridges.

American Steel & Wire has been the pioneer in furnishing special reinforcing strand for pretensioning systems of prestressed concrete in both regular and strain relieved grades.

Why American Special High Strength Reinforcing Strand was chosen for these bridges

1. It has good creep resistance, as well as a high ultimate strength of 238,000-268,000 psi. depending on wire size.
2. It is flexible and easy to handle.
3. It bonds firmly with the concrete when small diameter strands are used.
4. It assures consistent results . . . is uniform in size, strength and ductility.

Write for complete information about American Special High Strength Reinforcing Strand. American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio.

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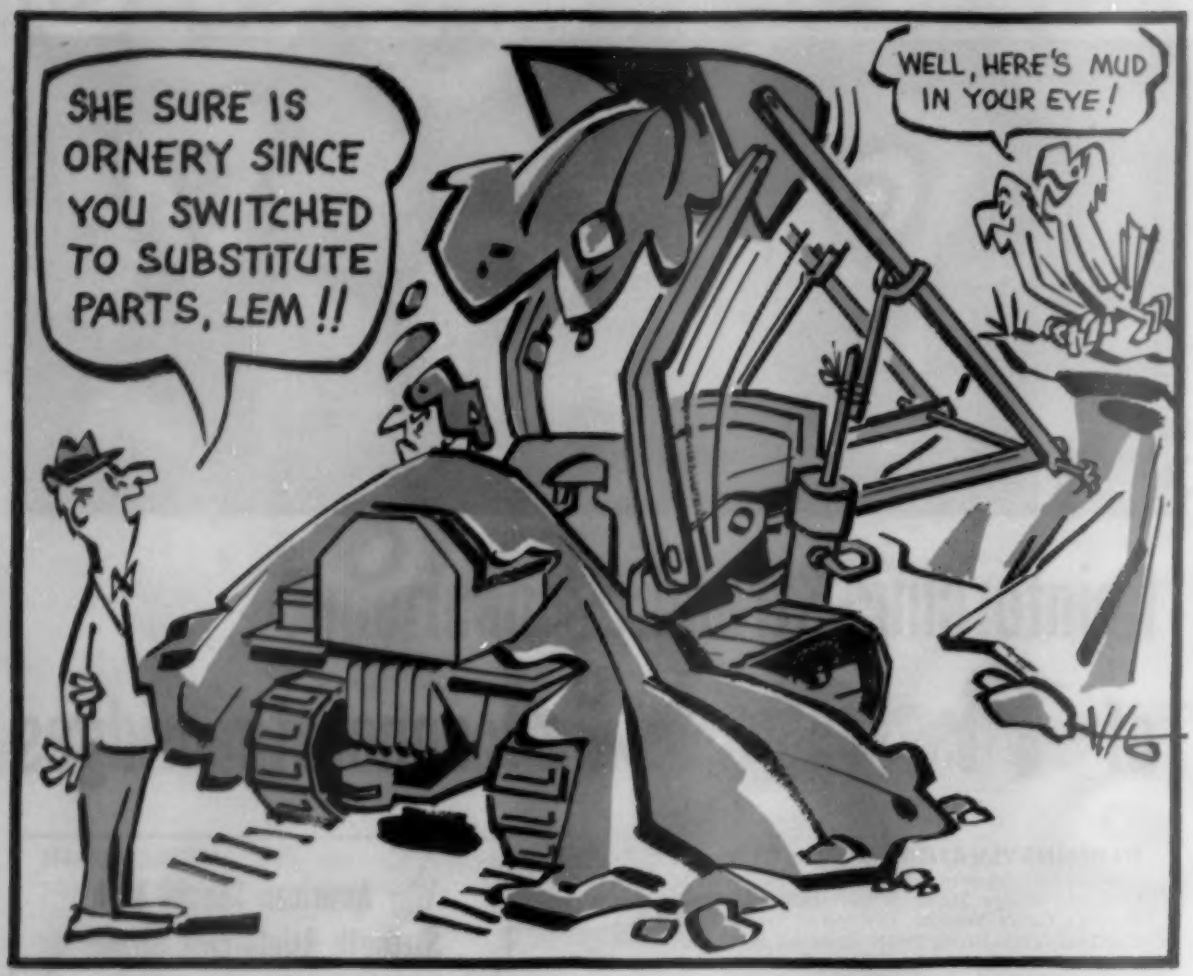
UNITED STATES STEEL



Down time is no joke. It happens, though. Maybe when intake and exhaust valves go bad.

If you replace with genuine Caterpillar valves, here's what you're sure of: valves designed to *fit properly* in your Caterpillar engine, and that means heads held to amazingly close tolerances, stems accurately machined, keeper tapers precision-ground, faces machined true to the center line of the stem. You're sure of valves *hardened* for longer wear. All around, you're sure of *less* down time in the future.

If you replace with substitute valves—can you be sure of anything?

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CAT® valves are made of special nickel-chromium alloy steel. Even at high operating temperatures, they resist distortion, corrosion and erosion.

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Production and Profits Go Hand-in-Hand with Traylor TY Reduction Crushers

Owners of Traylor TY Gyratory Crushers know that increased production means increased profits. They know that the exclusive design features and extra-heavy construction of a Traylor TY combine to boost production tonnage, reduce down-time and cut maintenance costs. As a direct result, profits go up hand-in-hand with the increased hourly output of a Traylor TY.

Furthermore, a Traylor TY's original, self-tightening bell head, with unique spring suspension, and curved concaves apply crushing power more efficiently. Increased capacity of each succeeding zone in the crushing chamber permits finer settings without choking or packing to produce greater tonnages with less power.

The compact design of a Traylor TY incorporates maximum strength with utmost simplicity of operation. TY Reduction Crushers are available in six sizes with feed openings from 3" to 22". Send for descriptive bulletin.

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than any standard V-belt

Here are the interesting reasons why Gates Super Vulco Ropes stand up months, even years longer than *any* standard V-belts...

1. *Super-Strength Cords* provide 40% greater horsepower capacity . . . easily absorb heavy shock loads. **2.** *Flex-Weave Cover* (U.S. Pat. No. 2519590) provides greater flexibility with far less stress on the fabric. Cover wears longer — increases belt life, lowers belt costs.

3. *Concave Sidewalls* (U.S. Pat. No. 1813698) provides sure pulling power, longer wear because sides straighten out as belt bends— make even contact with sheave walls.

Straight-sided belts bulge out when bent around sheave

Uneven contact causes uneven wear.

SHOCK LOAD of this big jaw crusher at Canadian Quarries, Ltd. is absorbed by Gates Super Vulco Rope Drive. Wherever shock load is severe, Gates Super Vulco Ropes cushion the shock—keep machinery replacement cost down.

4 other outstanding advantages

Resists Oil, Heat and Weather: Long life is assured even in the presence of excessive oil . . . even under prolonged exposure to heat and weather.

Provides Static Safety: The high electrical conductivity of Gates Super Vulco Ropes provide safer drives in explosive atmosphere.

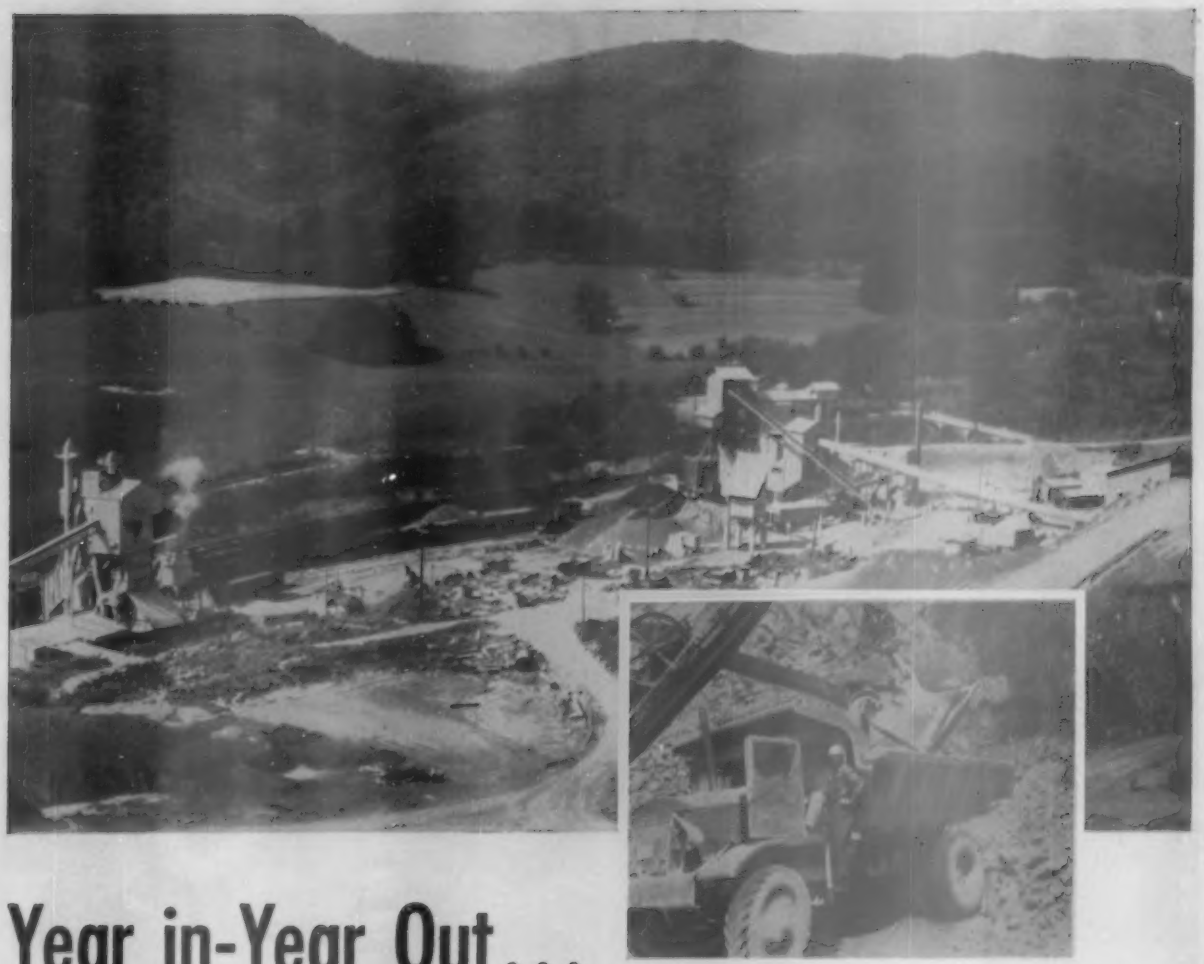
Has Little Stretch When Wet: Low moisture absorption eliminates need for special take-up in wet locations.

Saves Space: Higher horsepower rating and greater resiliency may permit fewer belts, or smaller sheaves where space saving is vitally important.

Gates SUPER Vulco Rope

The V-Belt with 40% more horsepower capacity

TPA 57



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Then too, like the Acme Limestone Co., you will appreciate Gulf's service, which will help you select the right lubricants and fuels for every unit of equipment you operate.

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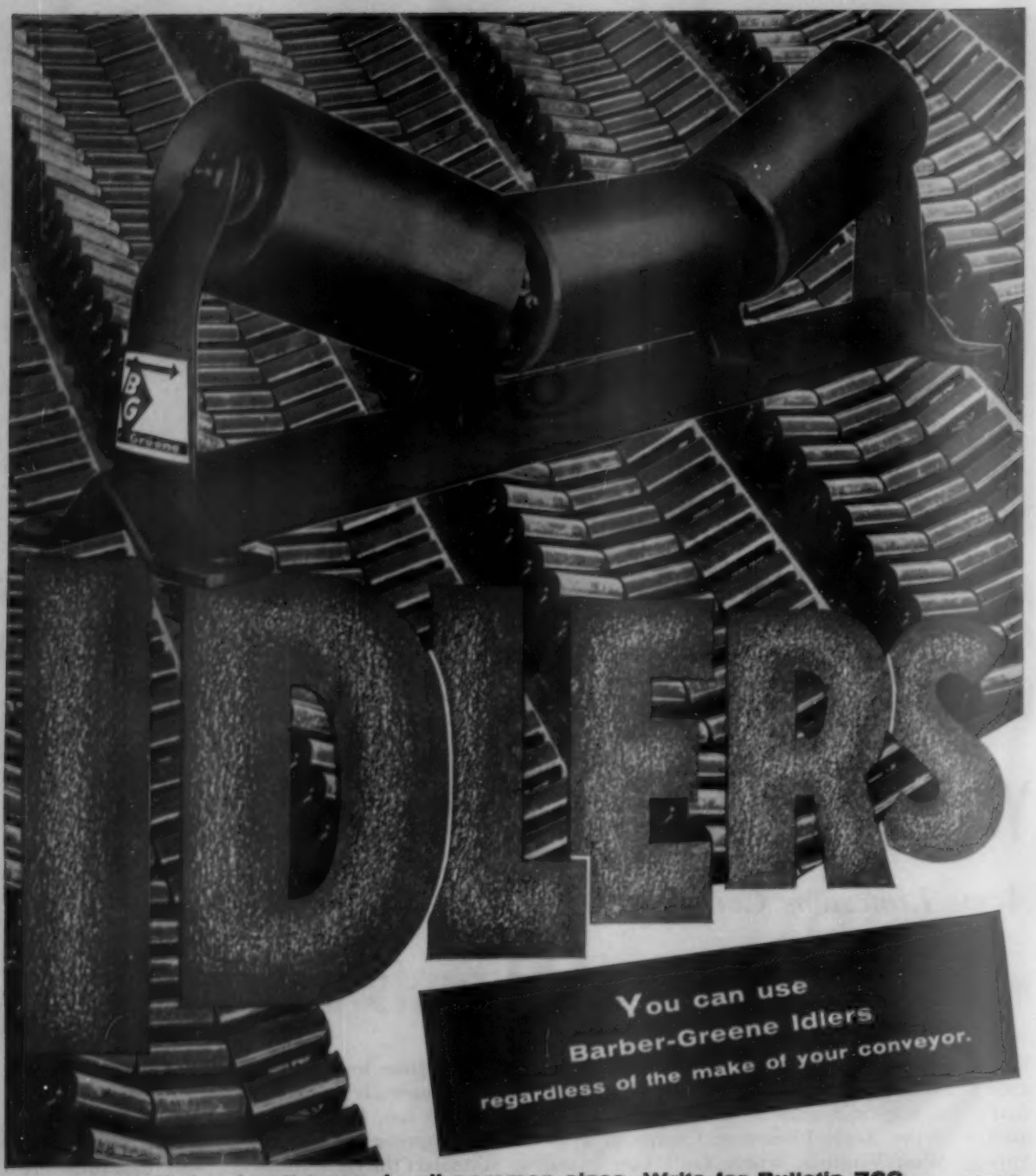

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. . . chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of rock or earth. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amsco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, *specify Amsco Renewable Lip Dippers.*

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AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

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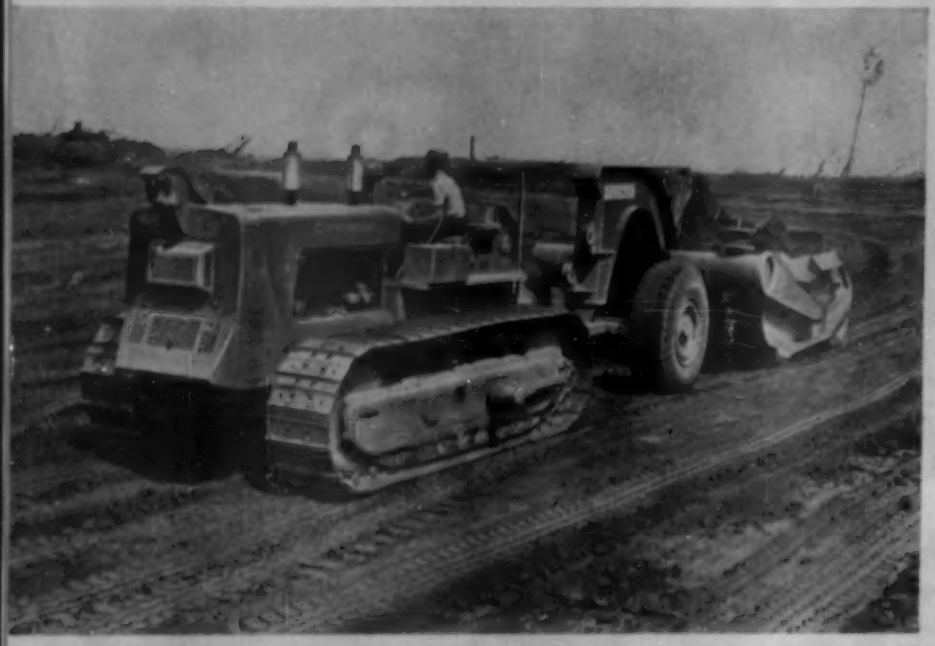
"1/3 more overburden daily than competitive crawlers" . . . that's the report from Merkli Brothers Coal Company, Beaver, West Virginia, on their TD-24. Unit is stripping 40 ft. of sandstone and shale to uncover a 12 to 51-inch coal seam. "It has better balance and visibility than other tractors," says Partner Henry L. Merkli. "It costs less to maintain; takes less time to grease, too."



Strips for barite ore—Near Cartersville, Georgia, Paga Mining Company's two TD-24's average a 4,000 ft. stripping cycle every 10 minutes. This includes time to self-load 15 cu. yds. Units are removing 50 ft. of overburden to reach a 15 ft. seam of 9 to 30% barite. They move 2,000 to 2,500 cu. yds. of spoil per 10-hour day. The plant produces 400 tons of barite in the same time, for use in chemical, paint, and oil industries.

Crushes gypsum—Near Avenal, Calif. Superior Gypsum Company's International-powered crusher produces 300 tons of gypsum per 8-hr. day. Material is used to neutralize high-alkali irrigation water.

1 more trip hourly—Fast loading and acceleration help 18½-yd. Pay-scraper make one more trip hourly than other self-propelled scrapers used by W. E. O'Neill Construction Company, Gary, Indiana. Cycle length averaged 2½ miles; material was mostly sand. For hauling ore, scraper interchanges with bottom-dump wagons.

Tows 1500-lb. loads and often 4500 lbs. Utility of IH wheel tractors is now unsurpassed. This unit tows castings for a plant near Longview, Texas . . . others do loader, fork-lift, similar tasks.

No repairs in 2 years of continuous crusher service—that's the record of the International 125 hp diesel shown above. Average output, in gravel pit near Bartlett, N. H., is 100 cu. yds. hourly.

Rugged in rugged rock—"TD-6 is ideal for opening underground mines," says M. McDonald, Kiabob Uranium Corp, Green River, Utah. "It gets around fast in narrow tunnels, yet brings out BIG loads."

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- ☐ Gilsonite
- ☐ Graphite
- ☐ Gypsum (raw or calcined)
- ☐ Ilmenite
- ☐ Iron Salts
- ☐ Lime, hydrated
- ☐ Lime, pebble
- ☐ Lime, pulverized
- ☐ Limestone, pulverized
- ☐ Litharge
- ☐ Magnesite
- ☐ Magnesium Oxide
- ☐ Malt
- ☐ Manganese Dioxide
- ☐ Milk, dried
- ☐ Mineral Wool
- ☐ Nylon pellets
- ☐ Ores, pulverized
- ☐ Petroleum Coke (fluid process)
- ☐ Phosphate Rock, pulverized
- ☐ Polyethylene
- ☐ Pyrites
- ☐ Quartz, pulverized
- ☐ Resins, synthetic
- ☐ Rubber pellets
- ☐ Salt
- ☐ Salt Cake
- ☐ Silica, pulverized
- ☐ Slag, pulverized
- ☐ Slate, pulverized
- ☐ Soap Powders
- ☐ Soda Ash
- ☐ Sodium Bicarbonate
- ☐ Sodium Phosphates
- ☐ Starches
- ☐ Sugars, refined
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Higher Availability
More Tonnage
Lower Costs

On scores of mine and quarry operations all over the world the high job availability of Euclid equipment results in more tons hauled per shift. Because they're engineered and built for the toughest off-the-highway service, "Eucs" stay on the job longer, with less time out for servicing and repairs.

Dependable low cost hauling has made Euclid the preferred equipment for open pit operations in both the metallic and non-metallic mining fields. If you're interested in cutting your hauling cost for ore, overburden or waste, have your Euclid distributor prepare a production and cost estimate for your operation. There's a good chance he can show you how to haul more tonnage at lower cost.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Rear-Dump models are available in 10, 15, 22, 34 and 50 ton capacities with engines of 165 to 600 h.p. . . . semi-rigid or spring mounted drive axles . . . standard transmissions or Allison Torqmatic Drives.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

EUCLID

GM GENERAL MOTORS

more performance . . .
FOR SUSTAINED HIGH OUTPUT!

more versatility . . .
FOR A WIDER RANGE OF WORK!

more dependability . . .
FOR LOWER JOB COSTS!

TWO NEW

HD-6

BULLDOZER-DRAWBAR TRACTOR

Weight	12,400
Drawbar hp	45
Belt hp	55

STEP UP PERFORMANCE, CUT JOB COSTS WITH EXCLUSIVE HD-6 FEATURES LIKE THESE . . .

- ★ Allis-Chalmers heavy-duty diesel engine — with "follow-through" combustion for long life, low upkeep.
- ★ 24-volt direct electric starting — for convenience and efficiency (standard equipment).
- ★ Wrap-around radiator guard for maximum strength and protection . . . tilts forward for easy service.
- ★ *Ceramic* master clutch lining — lengthens clutch life, reduces lever pull.
- ★ All-steel box-A main frame — protects the entire power train, makes possible superior balance . . . plus the service simplicity of unit construction.
- ★ One-piece steering clutch and final drive housing — for maximum strength, accurate bearing and gear alignment.
- ★ Double reduction final drives (straddle-mounted on tapered roller bearings) provide maximum ground clearance.
- ★ Roller bearing truck wheels — with Positive Seals that keep dirt and moisture out . . . grease in.
- ★ 1,000-Hour lubrication intervals for truck wheels, idlers and support rollers.
- ★ Tru-Dimension tracks — with new standards of strength and hardness *throughout* for extra wearability.
- ★ Unit construction — major assemblies like engine, clutches and final drives can be removed without disturbing adjacent parts.
- ★ Engine-mounted bulldozers — for top dirt-moving performance and extra tractor life.

ALLIS-CHALMERS ANNOUNCES
HD-6 SERIES TRACTORS

HD-6G

TRACTOR SHOVEL

Weight	19,600
Drawbar hp	45
Net engine hp	57
Bucket capacity	1-1/3 cu yd

...PLUS TRACTOR SHOVEL FEATURES LIKE THESE...

★ Extra long track (almost 7 ft on the ground) with six truck wheels per side — for real stability throughout the digging and loading cycle.

★ New two-position bucket — for easy full-capacity loading in any material (standard equipment).

★ Heavy-duty shovel assembly — built right into the tractor, not just an attachment.

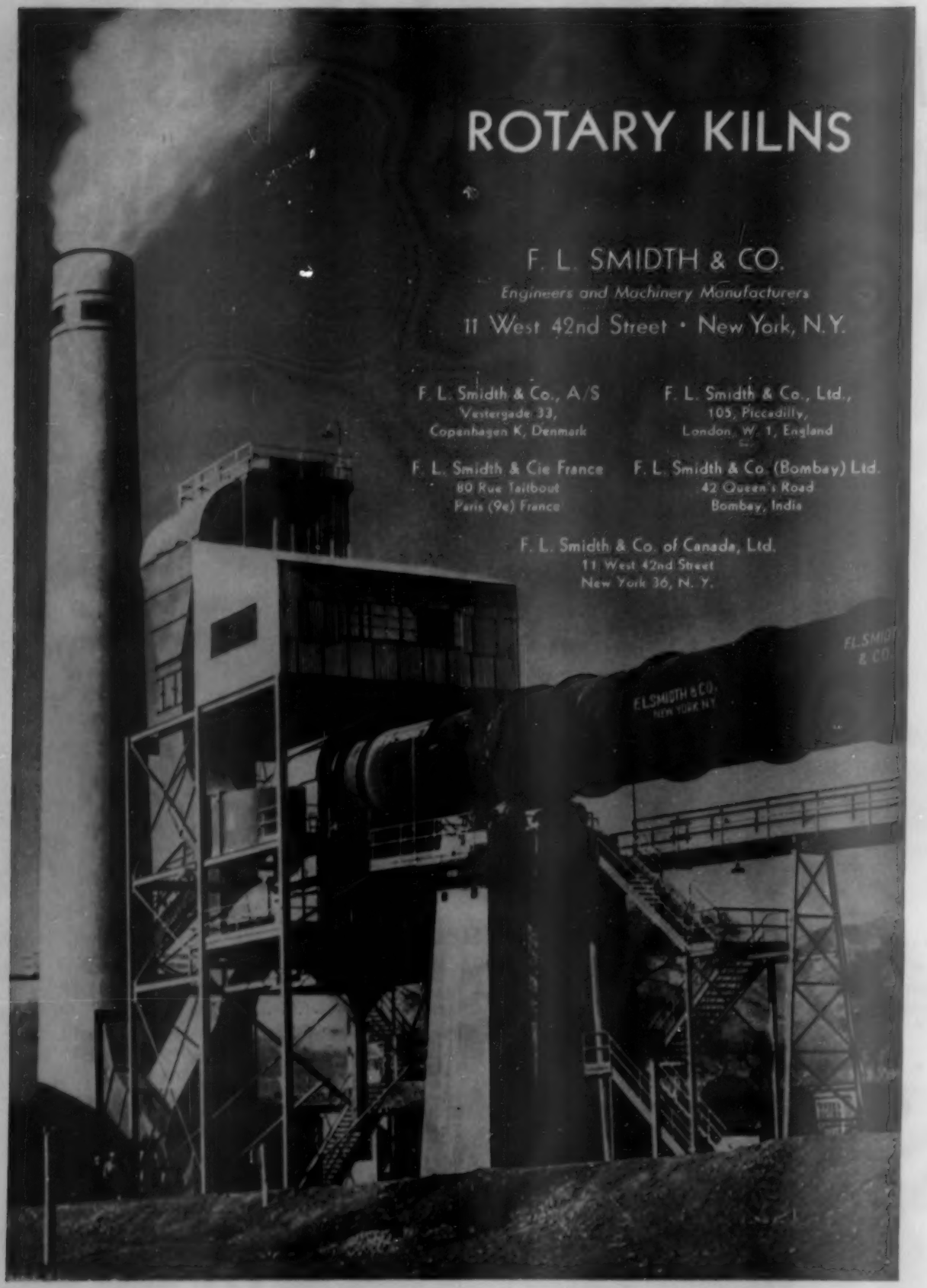
★ Simple, safe hydraulic system — with no exposed hoses or fittings on cowl or deck.

★ Two-speed reverse, high foam-rubber seat and easy bucket control — for new tractor-operator efficiency.

GET ALL THE FACTS NOW FROM YOUR NEARBY ALLIS-CHALMERS DEALER

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

November, 1955

A non-skid rock asphalt coating for highways has been tested by the Indiana Highway Department with some interesting results. The non-skid seal, a coating about ⅛ in. thick, was tried out on three dangerous stretches of highway for 18 months, and the accident statistics were compared with those for the preceding months. The number of accidents from all causes on the highways tested dropped from 153 to 64. Accidents occurring on a wet surface dropped from 90 to 14, and accidents due specifically to skidding on a wet surface fell from 66 to 2. There were four fatal accidents due to skidding on a wet surface before the coating was applied, and none after. The Governor said he was recommending that the Indiana State Highway Department apply the coating to all principal highways in the state.

Although about 650,000 acres of farm land are taken over by non-agricultural uses annually, total farm area today has increased to over 1.1 billion acres from 839 million acres in 1900, according to federal economists. In the last 10 years, one million acres annually of forest and barren land have been converted to farms through clearing, drainage or irrigation. Planting curbs, however, have cut acreage seeded to crops, so that pasture lands exceed the space devoted to crops. About 353 million acres were planted to 59 principal crops in 1955, a million acres less than in 1954.

Construction contract awards, in the 37 states east of the Rockies, totaled $16,130,149,000 for the first eight months of 1955, according to an F. W. Dodge report. This was an increase of 27 percent over the eight-month figure of last year. Nonresidential building contracts amounted to $5,706,605,000, up 24 percent; residential building, $7,232,168,000, up 33 percent; and utilities and public works, $3,191,376,000, up 21 percent.

Private homebuilding expenditures are expected to set another all-time record in 1956, even higher than the $14.6 billion record which Commerce and Labor Department experts expect them to set this year, according to **House & Home** magazine. The number of private houses started in 1956 is expected to decline slightly to about 1,250,000, compared with about 1,300,000 by the end of 1955, and 1,352,000 in the record year of 1950. Spending in 1955 is anticipated to be higher than 1954's $12.1 billion record by about $2.5 billion, and the 1950 dollar volume record by more than $3 billion.

Laticrete, a combination of liquid rubber and special cement, has been developed by the United States Rubber Co., Naugatuck Chemical Division, Naugatuck, Conn. It is said to give without cracking under heavy loads; dampens noise; resists alkalis and mild acids; is waterproof; and has a non-slip quality. It adheres to a clean, neutral surface such as concrete, metal or glass, curing in two or three days to provide a surface with a compressive load rating of 2500 p.s.i.

WHAT'S HAPPENING

Construction expenditures during 1956 are expected to rise to $44.1 billion despite the government's current restrained application of anti-inflation credit control brakes, according to a report in **Forum** magazine. This amounts to more than $170 million a day during each Monday to Friday work week. The construction boom will be a $2.3 billion or 6 percent gain over the $41.8 billion record for 1955, anticipated by the United State Departments of Commerce and Labor.

Talc is now being used in medical treatment for spontaneous collapse of the lung. The basis of the treatment consists of a suction to draw air out from the lung, and talcum to make the surface of the lung adhere to the chest wall. The treatment is reported to have been highly satisfactory, the average period of hospitalization being three days, compared with 43 days, according to the National Tuberculosis Association.

Histadrut, general federation of labor in Israel, has presented a gift of 47 tons of cement to aid in rebuilding flood-ravaged Connecticut. The presentation was made to Mayor Jasper McLevy of Bridgeport, Conn., by Dr. Dov Biegun, Histadrut's national secretary in America. The cement was shipped from a cement plant at Haifa, Israel, owned by Histadrut.

A joint contract to furnish 450 carloads of limestone has been awarded to Bloomington Limestone Co., Indiana Limestone Co., and Heltonville Limestone Co. The limestone will be used in the construction of the National Shrine of the Mother of God in Washington, D. C., the largest religious building in the world.

A city-owned crushed stone plant in Oregon has been closed as the result of protests by more than 100 city residents who complained of a "dust hazard." Operators of motels and a trailer court filed claims against the city, purporting heavy losses due to dust from the crusher.

An Ohio ready-mixed concrete truck driver recently reported a shortage of 79 sacks of cement, each weighing about 100 lb., when he arrived at the delivery point. Thieves had apparently made off with the load while the driver made a several-hour stop-off.

Lava from Mt. Etna is being used to produce a soft, gray insulating "wool" under a German patent. The insulating material is said to withstand greater heat than glass fiber. It is being used for insulation of Italian refrigerators, automobiles and ships, and two movie houses have installed it for acoustical properties. The United States government is studying the material for possible use in jet planes.

Heavy construction awards, nationally, totaled $14,134,171,000 for the first 39 weeks of 1955, an increase of 31 percent above 1954, and 15 percent higher than the previous record in 1952, as reported in **Engineering News-Record.**

THE EDITORS

Longer-Lasting!

Ludlow-Saylor

WOVEN WIRE SCREEN

"Super-Loy" screens have much greater resistance to wear—cut replacement, downtime and maintenance costs—retain their accurate openings—lower your cost-per-ton!

Immediate Shipment From Stock
of most sizes and weaves

Write For It!
Data Book & Screen Selector full of helpful information. Mail postcard today!

LUDLOW-SAYLOR WIRE CLOTH COMPANY
602 South Newstead Avenue, St. Louis 10, Missouri

SALES OFFICES: BIRMINGHAM — 1727 Sixth Ave., North • CHICAGO — 5607 W. Diversey • PITTSBURGH — Union Trust Building • HOUSTON — 1213 Capitol Ave.
WEST COAST: STAR WIRE SCREEN & IRON WORKS, INC., 2515 San Fernando Rd., LOS ANGELES; Subsidiary, LUDLOW-SAYLOR WIRE CLOTH CO.

MORE TONNAGE

...at less cost!

Low Voltage Resistance Heating Prevents Moist Materials From Adhering to Screen Cloth

By keeping screen cloth clear, the *Thermo-Deck* heating unit increases capacity in two ways . . .

1. Screening efficiency is improved on a clean deck.
2. Converts downtime into production time by eliminating the need for manual cleaning of cloth.

Increases Cloth Life, Too— With a *Thermo-Deck* unit on the job, screen cloths last as much as three times longer than unheated screens. Because blinding is eliminated, the necessity for destructive pounding, brushing and flame heating is also eliminated.

Thermo-Deck units may be used on all vibrating screens handling fine moist material. Installations can be made on single-deck screens or on any deck of a multiple-deck unit. A-4651

For Intermittent Feed, use *Sta-Kleen* Deck with Heating Unit

The use of a *Sta-Kleen* deck prevents fine materials from baking on screen during interruptions in feed. Rubber balls bouncing between the screen cloth and a retaining deck impart a dislodging vibration.

For complete information on the THERMO-DECK *heating unit, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 07B7812A.*

Thermo-Deck and Sta-Kleen are Allis-Chalmers trademarks.

ALLIS-CHALMERS

CUT HIGH TIRE COSTS DUE TO . . .

with Firestone Nylon Tires

FIRESTONE Nylon Off-The-Highway Truck Tires are built to deliver more hours of service on the toughest rock work, earth moving or strip mining job.

The Firestone Safety-Tensioned Gum-Dipped* nylon cord body with four extra tread plies absorbs toughest impact shocks. It gives the greatest protection against flex breaks, heat failures and damage due to cuts and snags.

You keep your downtime at a minimum with Firestone Nylon Tires. The treads give maximum traction and they are extra tough to resist cutting. The sidewalls are double thick to give added protection against costly sidewall injury.

Let your Firestone Dealer or Store show you how Firestone Nylon Tires can cut your tire costs.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP • ROCK GRIP • TRACTION ROCK • ALL NON-SKID • ALL TRACTION • RIB EXCAVATOR

When you buy new equipment or replacement tires, specify FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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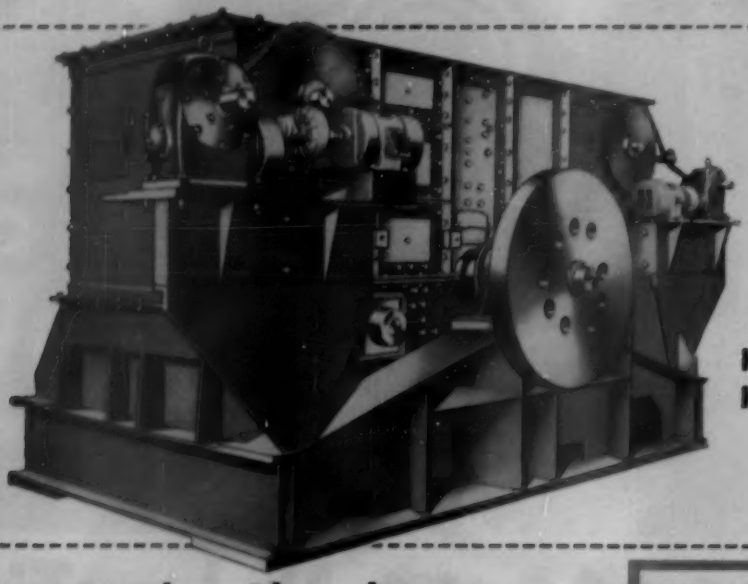
WET, STICKY MATERIAL CAN'T CLOG A

Bulldog Hammermill



HC
Non-clog

Traveling Breaker Plate keeps production going, hour after hour

Regardless of moisture, a BULLDOG NON-CLOG HAMMERMILL keeps your crushing operation going without clogging or jamming. Traveling breaker plate eliminates build up of material in breaking chamber . . . moving cleaning bar keeps discharge free at all times. You get steady hour after hour tonnage with no costly downtime.

For top performance in cement mill, mine and quarry plant operations choose a BULLDOG. Get a mill that has been designed, engineered and produced by hammermill specialists who have been doing the job better for 35 years. Every BULLDOG HAMMERMILL is "Engineered to your job" for greater output with less horsepower, longer hammer life, minimum maintenance. If you want to make better use of hammermills in your operations . . . consult our engineers. Tell us your crushing problems now.

The Bulldog Hammermill Line

For primary and secondary crushing

- Non-Clog Moving Breaker Plate Hammermills for Wet Materials
- Stationary Breaker Plate Hammermills for Dry Materials.

For secondary crushing and Fine Reduction

- Center Feed Hammermills

Capacities 1 to 1000 tons per hour

Recommended for

Limestone • Clay • Shale • Bauxite
Gypsum • Coal • Wood Fibre • Coke
Carbons • Iron Ore • Lime • Fullers
Earth • Phosphate • Mud Balls • Bones
Tankage or any reducible material

Subsidiary of
PETTIBONE
Mulliken Corp.

AUXILIARY EQUIPMENT:
FEEDERS • CONVEYORS • SCREENS • BINS

HAMMERMILLS, INC.

617 C Avenue, N.W., Cedar Rapids, Iowa

Anything Less is an Old-Fashioned Truck!

If you don't get all the modern advantages new Chevrolet trucks offer, you stand to lose money on the job today and at trade-in time tomorrow

Look at it this way. The more modern the truck, the more quickly and efficiently it does the job. And if it's loaded with ultra-modern features, you're bound to be farther ahead at trade-in time. Now look at the way Chevrolet fills the bill. Even so-called new trucks are old fashioned without all these Task-Force advantages!

Shortest stroke V8's* of any leading truck—the most modern truck engines money can buy! Their compact, short-stroke design means longer life, because of less friction and wear. Chevrolet's extra-rugged and dependable high-compression valve-in-head Sixes are ultra economical to keep humming. They squeeze more power out of a tankful of gas!

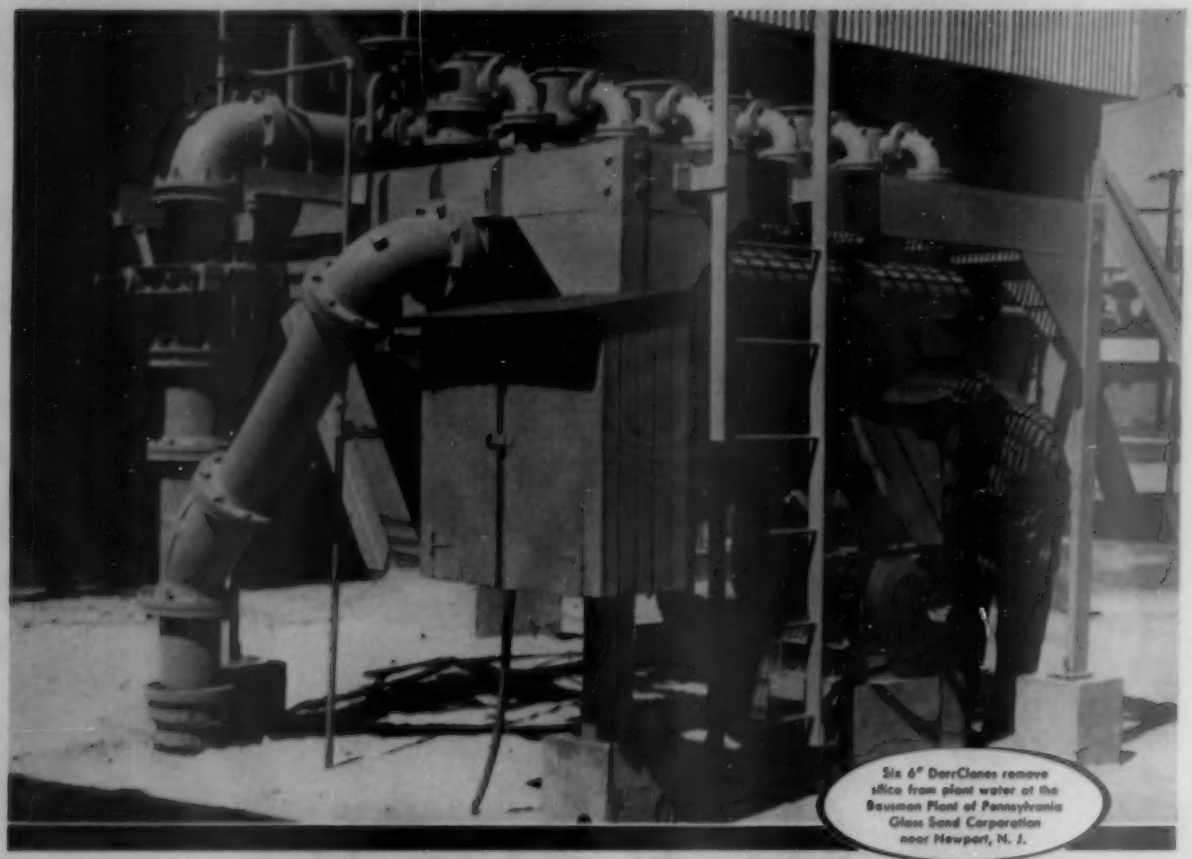
The latest in cab comfort and safety—High-Level ventilation, panoramic windshield, concealed Safety Steps—features that boost driver efficiency!

Most modern chassis features—new suspension, more rigid ladder-type frames, Power Brakes standard equipment on 2-ton jobs!

Work Styling—Here's heavy-duty styling that's matched to the job; modern styling that calls attention to your business! Your Chevrolet dealer has complete details. See him soon. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**V8 standard in L.C.F. models, an extra-cost option in all others except Forward-Control models.*

NEW CHEVROLET Task-Force TRUCKS



Six 6" DorrClones remove silica from plant water at the Bauman Plant of Pennsylvania Glass Sand Corporation near Newport, N. J.

Pennsylvania Glass Sand Corp. Cleans Water Supply with **Six 6" DorrClones* Operating Under Hydrostatic Head...**

Operating Cost Negligible

An unusual operation . . . yes, because of the absence of a pump in operating a battery of six 6" rubber lined DorrClones which remove fine silica from waste water.

Here was the problem — Overflow from a 12 ft. wide classifier, dewatering 70 to 80 tons of silica per hour, was returned to a supply pond. Although this flow contained only 0.3% to 0.4% solids, continuous build-up of 12 to 15 tons of silica per day in the pond necessitated periodic dredging.

Here's how it was solved — Six DorrClones, each handling 100 gpm, were mounted side by side and manifolded to an 8" feed header. Operating pressure of 10-11 psi is supplied by hydrostatic head. This pressure differential is the result of the installation of the cyclone at ground level, roughly 30 ft. below the classifier. Flow is controlled to each unit by rubber pinch valves. Overflows discharge to the common header carrying cleaned water to the supply pond. Underflow is collected in a sump and pumped to the tailings dump. Recovery of 99.7% of the silica, discarded with plant tailings, prevents accumulation of solids to the water supply . . . reduces solids loading in the pond to 50 pounds per day. Operating costs of the 6 DorrClones are negligible because no power is required due to the available hydrostatic head, and low pressure operation minimizes wear.

We'd like to tell you more about how DorrClones can be used in your flowsheet. Just drop a line to Dorr-Oliver Incorporated, Stamford, Conn.

*Trademark Reg. U.S. Pat. Off.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH · ENGINEERING · EQUIPMENT
STAMFORD · CONNECTICUT · U.S.A.

New Model Bucyrus-Erie Walking Dragline

GOES TO WORK IN FLORIDA PHOSPHATE FIELDS

770-B

Electrically Driven with Ward Leonard Control

The first Bucyrus-Erie 770-B Walking Dragline was shipped recently to the phosphate fields near Bartow, Fla. It's the first installation of this particular model, but it's not a first for the stand-out features which forecast success for this newest member of the Bucyrus-Erie line. The 770-B will be at home on its multi-million yard assignment because of high output features such as these:

The dragline's all-welded boom, composed of T-section chord members with tubular bracing, combines maximum strength for carrying heavy payloads with minimum deadweight that keeps swing inertia and roller loads low. Excellent maneuvering ability is provided by the exclusive Bucyrus-Erie walking mechanism. Swing is accelerated and decelerated rapidly under Ward Leonard rotating control . . . digging and hoisting are fast, too, because both the drag and hoist drum units have their own individual motor drive.

These are only a few examples of the many 770-B features that mean outstanding performance in all stripping or other long range excavating operations requiring standard bucket sizes of 18 and 14 cu. yds. with corresponding boom lengths of 195 and 225 feet.

68L55C

BUCYRUS ERIE
South Milwaukee
Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who
Shape the Earth

Crushing Life Increased 14 Times *by* **Hard-Facing**

The hard-faced rolls on this rock-crusher mill have been in constant operation for six years. During this time, the rolls have been pulverizing such abrasive materials as ferro-alloys, ore, dolomite, feldspar, rock, sand, and clay used for making brick. Unprotected rolls, performing the same operations, had to be replaced every four or five months.

The serrated roll shown at the right in the photograph is the roughing roll used for initial grinding or milling. The smoother roll, at the left, is a finishing roll used to grind the abrasive materials into a powder. Both rolls were hard-faced with HAYNES STELLITE alloy by the metallic-arc process to protect them from abrasion.

There are 14 HAYNES alloys . . . each developed to resist certain conditions of wear. Some of these alloys are hard and abrasion-resistant, some are tough enough to stand up under heavy impact . . . others resist corrosion, erosion, or heat. Use them to protect bull-dozer blades, dipper bucket teeth, sheepsfoot tampers, tractor rollers and other metal parts exposed to wear.

Your dealer carries a complete line of HAYNES hard-facing rods. Ask him for our descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana, for full details.

See... | Your local Haynes Stellite Dealer

or

Write... | to Haynes Stellite Company

"Haynes" and "Haynes Stellite" are registered trade-marks of Union Carbide and Carbon Corporation.

DRILLING 70′ TO 80′ OF 3″ HOLES PER HOUR IN HARD LIMESTONE, ON 7 GALLONS OF FUEL: Marble Cliff Quarries, one of Ohio's largest, is using this Jaeger Rotary 600 on these two quarry rigs with 4″ drills and air tugger hoists to drill 19′ holes of 3″ final diameter in hard flux limestone. Because of the constant, unfluctuating 100 lbs. pressure maintained by the Jaeger Rotary, each drill averages 350′ to 400′ per 10-hr. day. The compressor never runs faster than 1600 rpm, with a resulting minimum of wear and fuel consumption of only 7 gph.

Jaeger offers a fully efficient rotary "600"

In more than a year of use, on all types of big air work, the Jaeger Roto "600" has demonstrated two outstanding advantages over other rotary compressors. (1) *It operates at slower speeds,* resulting in lowest fuel consumption and longest life of engine and compressor. (2) It maintains 100 lbs. minimum pressure under all normal operation, *as smooth as steam.* Speed modulation is stepless over the entire operating range, and so instant-acting as to prevent any over-run and racing of engine. Controls are also extremely simple.

Jaeger also offers more efficient oil cooling, closer control of engine water temperature, elimination of cold weather "dry starts", 8-hour fuel tanks, wrap-around bumpers and many other advantages. For complete information, see your Jaeger distributor or send for Catalog JCR5.

Jaeger Roto "600"

Model "125" rotary is also available for smaller work.

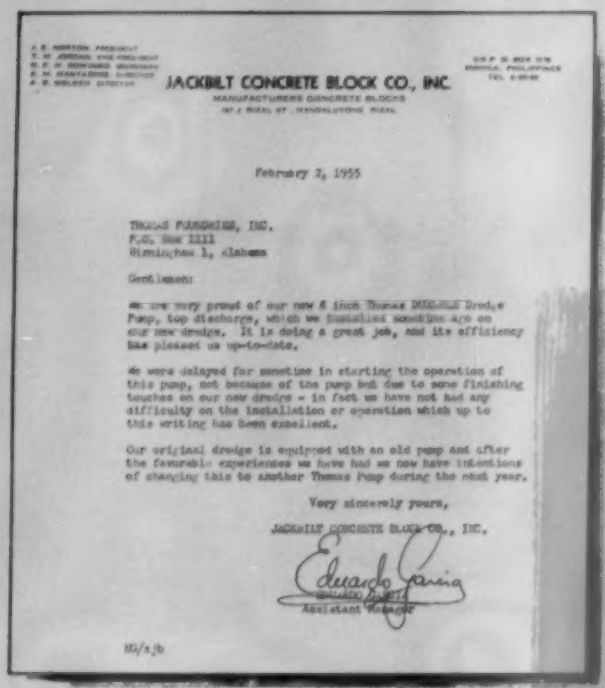
THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

PUMPS • LOADERS • MIXERS • TRUCK MIXERS • PAVING MACHINES

In the Philippines They Say:

"LOS RESULTADOS SON EXCELENTES!"



JACKBILT CONCRETE BLOCK CO., INC.

MANUFACTURERS CONCRETE BLOCKS

February 2, 1955

THOMAS FOUNDRIES, INC.
P.O. Box 1111
Birmingham 1, Alabama

Gentlemen:

We are very proud of our new 6 inch Thomas DURABLE Dredge Pump, top discharge, which we installed sometime ago on our new dredge. It is doing a great job, and its efficiency has pleased us up-to-date.

We were delayed for sometime in starting the operation of this pump, not because of the pump but due to some finishing touches on our new dredge - in fact we have not had any difficulty on the installation or operation which up to this writing has been excellent.

Our original dredge is equipped with an old pump and after the favorable experiences we have had we now have intentions of changing this to another Thomas Pump during the next year.

Very sincerely yours,

JACKBILT CONCRETE BLOCK CO., INC.

Eduardo Garcia
Assistant Manager

EG/s.jb

Stateside This Means: "IT DOES A GREAT JOB!"

Senor Garcia is another Sand and Gravel producer who has found Thomas DURABLE DREDGE Pump doing a great job. No wonder he is enthusiastic over his increased production and reduced operating costs.

NO MATTER HOW YOU SAY IT—no matter where they are used—the first Thomas Pump installed invariably leads to a second and third Thomas Pump installation to replace other makes which are less efficient, less durable and are more costly to operate.

Read Senor Garcia's letter above and the familiar statement he makes "WE NOW HAVE INTENTIONS OF CHANGING ANOTHER OLD PUMP TO A THOMAS".

Modern abrasion-resisting alloy (Thomas Ni-Hard) plus modern Thomas Pump design produce the results responsible for this decision.

YOU CANNOT BUY, AT ANY PRICE, A MORE DURABLE PUMP FOR SAND AND GRAVEL — YOU CANNOT BUY ONE THAT WILL MAKE YOU AS MUCH MONEY.

Thomas DURABLE DREDGE PUMP is made in a range of sizes from 6" to 16" discharge and arranged to discharge top or bottom, right or left.

Be skeptical—ask us for proof—get the facts for yourself.

WRITE OR WIRE US TODAY.

THOMAS FOUNDRIES, *Incorporated*

P.O. BOX 1111 . . . . BIRMINGHAM, ALABAMA

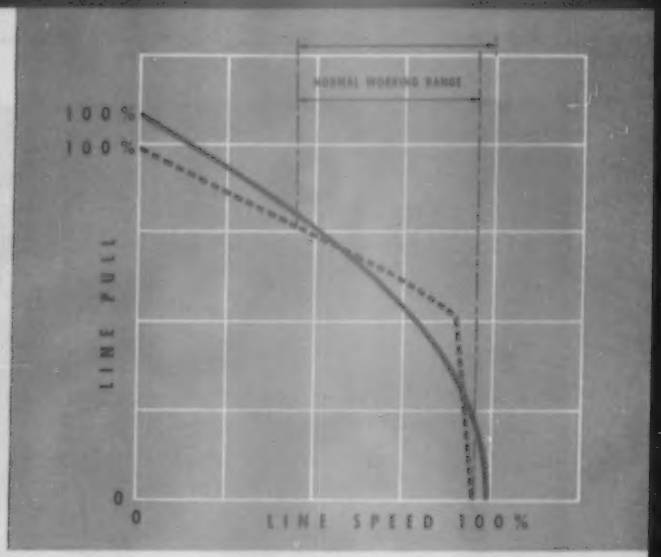
LIMA'S new Electric Power Unit eliminates stalls, won't burn out

LIMA's new optional power unit matches, *electrically*, diesel-torque converter performance. It combines an AC motor with a single stage torque converter to adapt actual power output to work load demand—at constant motor speed. Thus, you get power on demand through a wide operating range . . . and the motor will not stall or burn out in heavy load operation.

Just check the performance curves —— They make it clear that LIMA's new electric power unit is the perfect answer when your job calls for electrically powered machines. The new unit is available on every LIMA machine. It will pay you to get the full story today from your nearby LIMA distributor . . . or write: Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

CAPACITIES

Shovels to 6 yds.
Cranes to 110 tons.
Crawler, wheel or truck mounting available on smaller sizes.

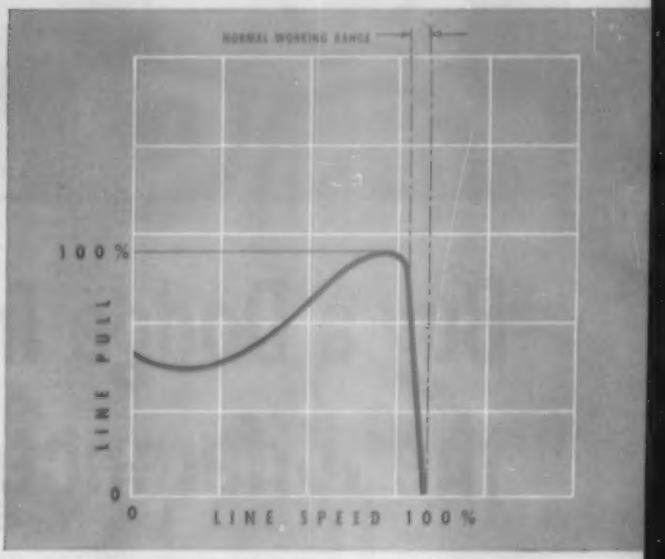


Power Performance of LIMA'S New Optional Unit:

A.C. Electric motor with torque converter drive [Diesel-torque converter curve (dotted line) shown for comparison]

With this drive, even under extreme loading, the motor will pull down in speed only a very small amount. It can never be stalled.

The line pull will constantly increase through a long pull down speed range, depending upon the load applied.



Power Performance: A.C. Electric motor with direct drive

The motor speed and torque varies as shown for line speed and pull.

With a pull down in speed of only 3% to 5%, torque rises too fast. The motor will stall quickly after peak torque is reached. Workable speed range is small, stalls are frequent.

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES
DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Buy a Dodge Truck and pocket the difference

Save first, and always, with a Dodge truck! New low prices bring famous Dodge dependability within the reach of every truck owner. What's more, Dodge work-proved long life and low operating costs mean extra savings over the years.

As for performance, Dodge offers you the greatest power line-up of any trucks on the road! Smooth-running Dodge Sixes are famous the world over for economy. New Dodge Power-Dome V-8's, with 169 to 202 hp., are the most advanced, most powerful engines in any leading trucks.

But see for yourself. Your dealer has a Dodge truck which will save you money and speed your work. See him today.

"Mile-after-mile economy"

Says JOHN G. JOHNSON
Walter S. Johnson Building Co., Inc.
Niagara Falls, N. Y.

"It's not just the low initial cost that keeps us sold on Dodge trucks—it's their mile-after-mile economy of operation that counts even more."

DODGE
Job-Rated
TRUCKS
WITH THE *FORWARD* LOOK

YOUR WICKWIRE ROPE DISTRIBUTOR SAVES YOU DOWN TIME

When the lack of the proper wire rope halts your production or your operations, thank your lucky stars that your helpful Wickwire distributor is only a quick phone call away. It's a wonderful feeling...to know you'll be getting exactly what you need from his warehouse stocks in only a few hours time.

Now contrast that with the cost in time, money and inconvenience of emergency shipments direct from a distant manufacturer.

In addition to saving on down time, your Wickwire distributor effects further economies by recommending the wire rope that will give you the longest service life, by minimizing your bookkeeping, inventory maintenance and transportation costs. He keeps your reserve stocks for you so that you don't tie up capital in stand-by materials, warehouse space and unnecessary stock insurance and handling.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

3152

BIENNIAL SHOW

NSGA
NATIONAL SAND AND GRAVEL ASSOCIATION
40th ANNUAL CONVENTION

NATIONAL READY MIXED NRMCA CONCRETE ASSOCIATION
26th ANNUAL CONVENTION

To give you the Show you mustn't miss, we are moving to Chicago Coliseum

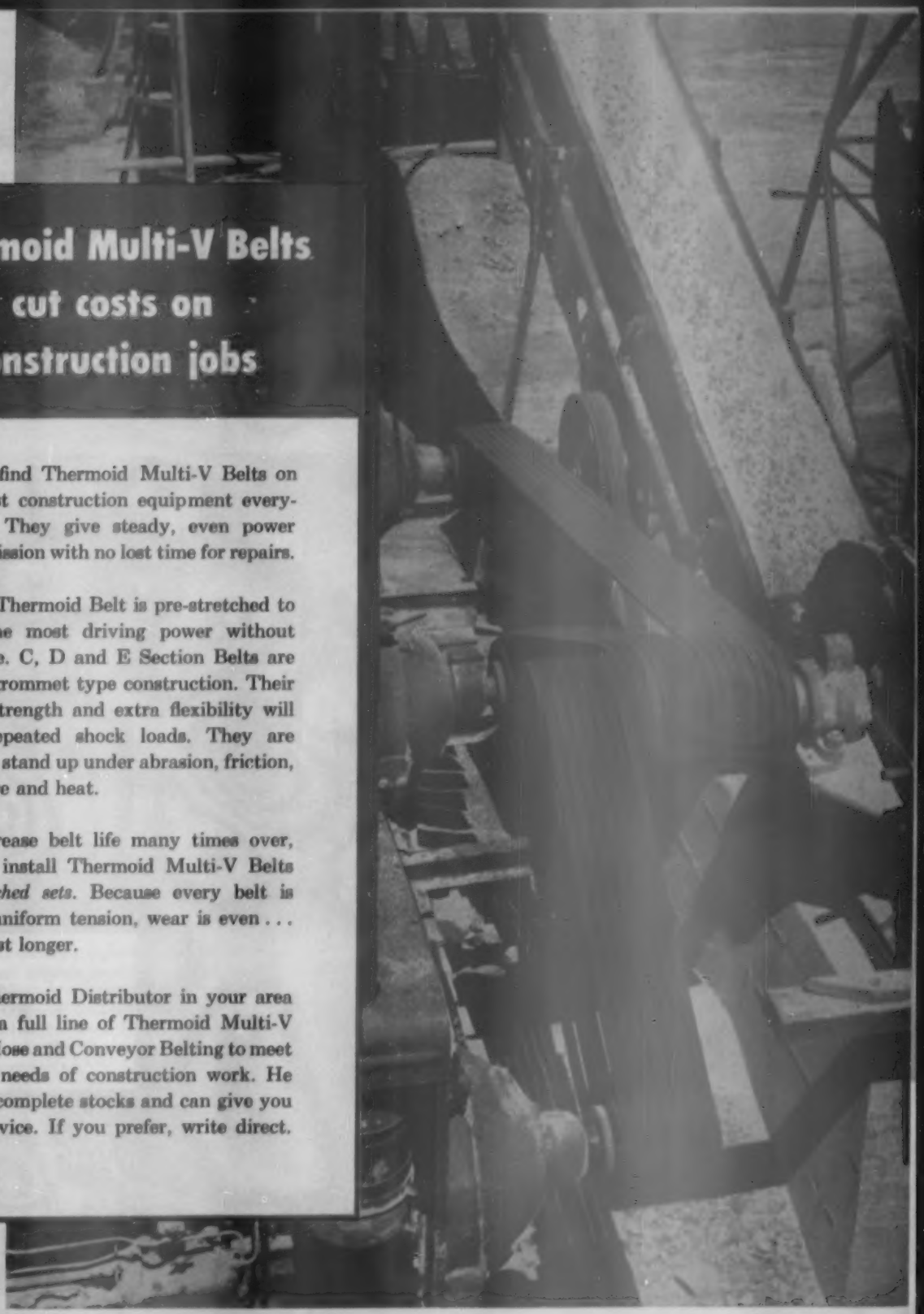
February 13-16, 1956

Filling the 3 halls of the Chicago Coliseum, (73,000 sq. ft. of floor space with almost unlimited head room and load capacity), you will see the most complete exhibit of our industries' equipment ever assembled, *shown as it is actually used.* It is your opportunity to get up-to-date on revolutionary developments that are taking place in machinery and techniques.

SHOW ADMISSION IS FREE to both producers and users of sand, gravel and ready mixed concrete. Mark your calendar now—*February 13-16. Place: Chicago. Event: The show you mustn't miss.*

NATIONAL SAND AND GRAVEL ASSOCIATION
NATIONAL READY MIXED CONCRETE ASSOCIATION

Convention meetings at the Conrad Hilton just a jaunt up Wabash Avenue from the Coliseum. Sessions planned to help you solve your own problems and unite industry opinion in preparation for critical days ahead.



Thermoid Multi-V Belts cut costs on construction jobs

You'll find Thermoid Multi-V Belts on the best construction equipment everywhere. They give steady, even power transmission with no lost time for repairs.

Every Thermoid Belt is pre-stretched to give the most driving power without slippage. C, D and E Section Belts are rayon-grommet type construction. Their brute strength and extra flexibility will take repeated shock loads. They are built to stand up under abrasion, friction, moisture and heat.

To increase belt life many times over, always install Thermoid Multi-V Belts *in matched sets*. Because every belt is under uniform tension, wear is even . . . belts last longer.

The Thermoid Distributor in your area carries a full line of Thermoid Multi-V Belts, Hose and Conveyor Belting to meet all the needs of construction work. He carries complete stocks and can give you fast service. If you prefer, write direct.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

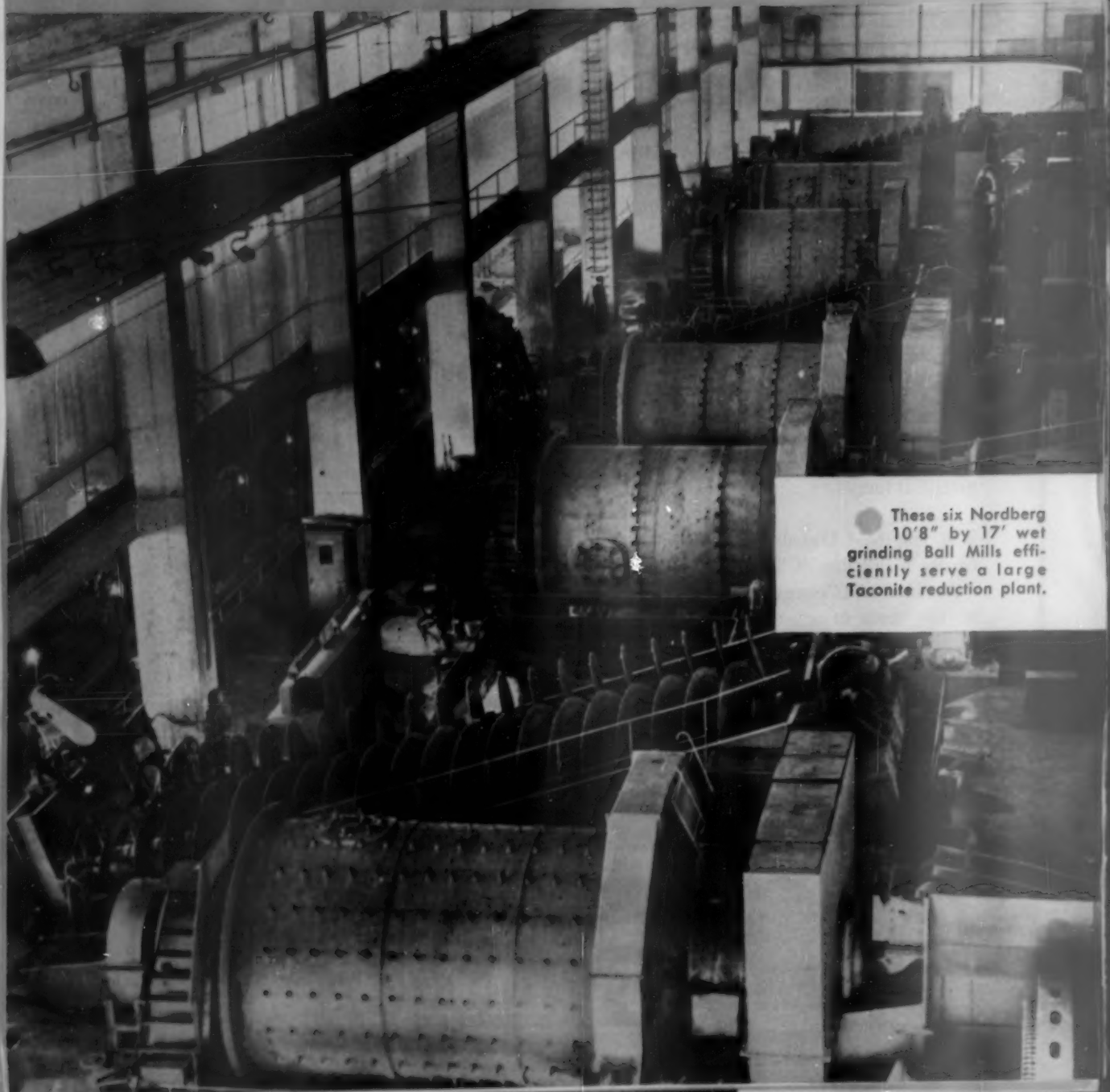
Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

. . . from the ARCTIC to the EQUATOR

. . . from the FAR EAST to CONTINENTAL EUROPE

NORDBERG

are Industries' choice for the efficient



These six Nordberg 10'8" by 17' wet grinding Ball Mills efficiently serve a large Taconite reduction plant.

GRINDING MILLS

reduction of ORES, CEMENT and MINERALS

These two views show eight Nordberg Grinding Mills used for raw and finish grinding in the plants of a leading cement producer. Above is a 10'8" by 16' Ball Mill and a 9'6" by 32' Compartment Mill. Below are two 10'8" by 17' and two 9'6" by 11' Ball Mills, together with two 8'6" by 36' Compartment Mills.

MORE than half a century of progressive engineering achievement, combined with quality production in modern manufacturing facilities, have won for Nordberg a foremost position in the field of heavy machinery manufacture.

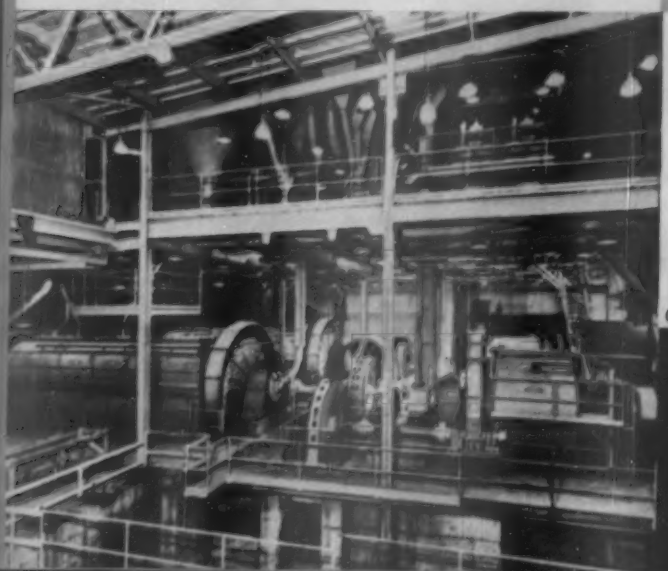
This is evidenced by the universal acceptance which Nordberg Machinery has received by most of the Mining and Mineral processing industries throughout the world.

Typical of this heavy machinery is the complete line of Nordberg Grinding Mills for raw and finish grinding of cement materials, the fine reduction of metallic and non-metallic minerals and for numerous other processes where friable material must be comminuted to fine sizes.

Nordberg manufactures Ball, Tube, Rod and Compartment Mills, of grate, overflow and peripheral discharge types for wet or dry grinding service, in sizes ranging from 6 feet to 13 feet in diameter, and up to 50 feet in length.

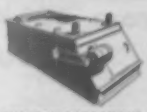
For large or small operations, you can depend on Nordberg Machinery to deliver maximum output at lowest possible cost. Write for further information. *NORDBERG MFG. CO., Milwaukee, Wis.*

SYMONS . . . *a registered Nordberg trademark known throughout the world*



SYMONS GYRATORY CRUSHERS

SYMONS CONE CRUSHERS



SYMONS VIBRATING GRIZZLIES and SCREENS

SYMONS V-SCREENS

NORDBERG KILNS and COOLERS

NORDBERG DIESELS— 10 to over 12,000 H.P.

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GM155

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

There's a Du Pont blasting "team" for every size drill hole

2,300 pounds of dynamite were loaded into 99 wagon drill holes (6′ x 6′ spacing) in this 22′ face at the Superior Stone Company granite quarry, Jamestown, North Carolina. For the maximum amount of well-broken rock, Superior used a Du Pont blasting "team"—1¼ x 12 Gelex #1, MS Delay Electric Blasting Caps and a CD-48 Blasting Machine.

Blaster priming a stick of Gelex #1 dynamite with MS (millisecond) Delay Blasting Caps. MS-25 through -175 Delays were used successfully to reduce vibration, improve fragmentation and minimize backbreak.

Powder man loading 1¼ x 12 Gelex #1 in wagon drill hole. Holes loaded with this economical dynamite were connected in four series in parallel and fired with a CD-48 Blasting Machine.

Superior fragmentation, minimum backbreak

from "TEAM" in southern quarry's wagon drill holes

6,000 tons of well-broken rock. Gelex #1 dynamite supplied the power, MS Delay Electric Blasting Caps the control, CD-48 Blasting Machine the means of initiation. Result: another blasting job efficiently, economically accomplished.

WHETHER it's a wagon drill hole or the largest of well drill sizes, Du Pont can supply you with grades and sizes of dynamite to match any diameter. For specifications on dynamite or any other member of the dependable Du Pont blasting "team," talk to the Du Pont representative in your area, or write E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

Keep Preparation Costs at Rock-Bottom

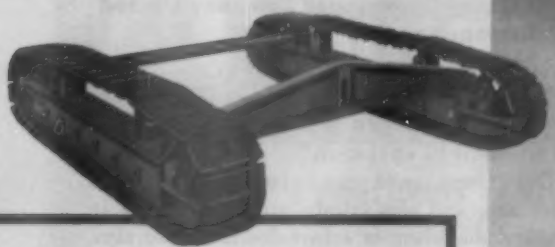
Because economical preparation of rock is not just a matter of speed, it pays to take a close look at the other factors which determine overall operating costs of your drilling equipment—items like purchase price, maintenance, depreciation, bit life. On all these points you'll find Bucyrus-Erie cable tool blast hole drills are hard to equal.

They can put down hole in the toughest formations. Drilling speed, length of stroke, and tool weight are all coordinated to provide a concentration of maximum energy where it counts most—at the bottom of the hole. They're built to stand up under toughest drilling conditions, too, with their long wide crawler mounting, shock-resistant drill frame, rigid well-braced derrick, and quality construction throughout.

For detailed information, write for a free copy of these 24-page illustrated bulletins: 50-T, for 9- to 12-in. holes; 29-T, for 6- to 9-in. holes; 27-T for 6- to 6⅝-in. holes; and 22-T, for 5⅝- to 6⅝-in. holes.

28865C

All-steel welded drill frame forms a shock resistant box for drilling machinery . . . has ample strength and rigidity to withstand shocks and stresses of tough drilling.



Based on Bucyrus-Erie's long experience in the design of crawler traction for excavators, this mounting gives solid support to the drill frame . . . requires little maintenance even after many years of service.

Tubular bracing ties derrick to drill frame, and resists twisting and bending forces created by carrying heavy tool strings. With the sharp hit-and-snap-up action provided by derrick head shock absorber, each drilling blow effectively shatters toughest rock.

BUCYRUS ERIE

South Milwaukee Wisconsin

1880 75 1955

YEARS OF SERVICE to Men Who Shape the Earth

Speed Delivery of Lightweight Slag at Hamilton because . . .

Look at this line-up of rugged Whites engineered right to the job for the Quigley Construction Company Limited at the new National Slag Ltd. plant at Hamilton. They transport thousands of tons of slag hourly in southwestern Ontario . . . on tight schedules . . . day after day.

Their outstanding record on constantly expanding service proves Whites have the quality and the engineering that gets more work done . . . faster!

Find out how you can have this same White dependability and low operating costs . . . have bigger payloads . . . do more work . . . in your business. See your White Representative.

One of the White six-wheeler dump trucks with 18 cu. yd. body (14' x 7') in the Quigley fleet.

"We tailor our Whites to the exact work they do . . . and they do more of it!"

. . . Robert P. Quigley, President, Quigley Construction Company Limited Bartonville, Ont.

"Over four years ago, we agreed to standardize on Whites," President Quigley says. "This move has paid off time after time in actual performance and economy of operation."

"Our drivers are as proud of our Fleet of Whites as we are, and this combination of quality in men and machines is a sure-fire one," he says.

Through city traffic, over-the-highway, and off-the-road, Whites are right for Quigley operations—from their Model WC-2262 dump trucks with 18 cu. yd. bodies, to the husky WC2462 PLT tractors with 32 cu. yd. dumping semi-trailers.

THE WHITE MOTOR COMPANY

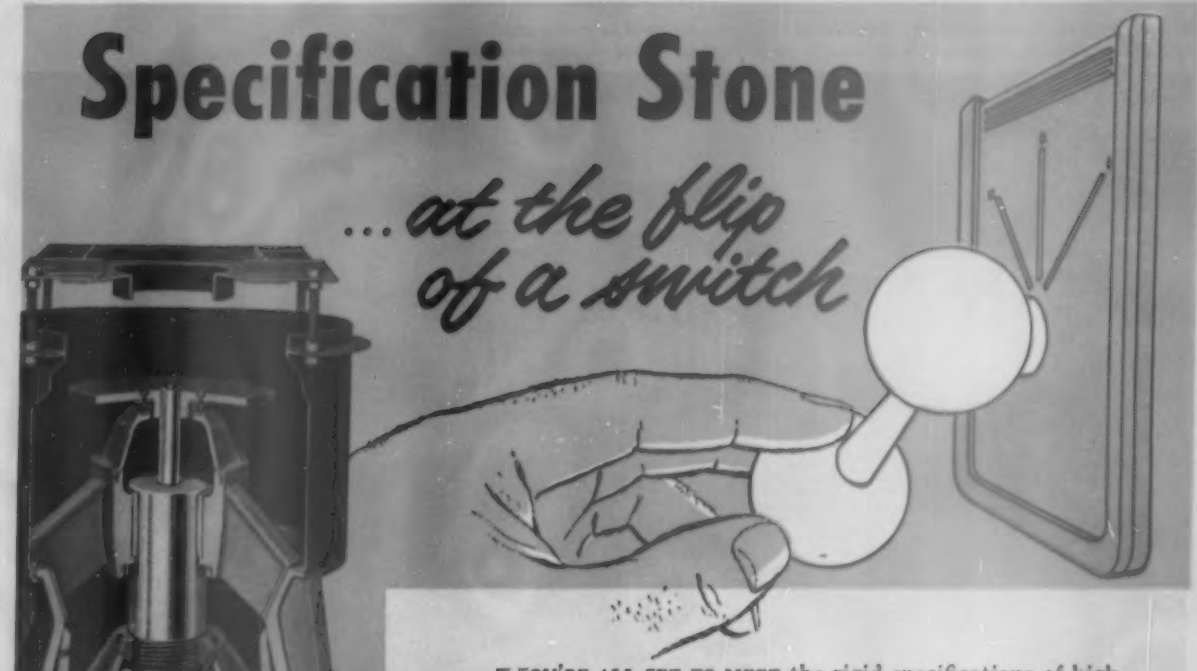
Cleveland 1, Ohio

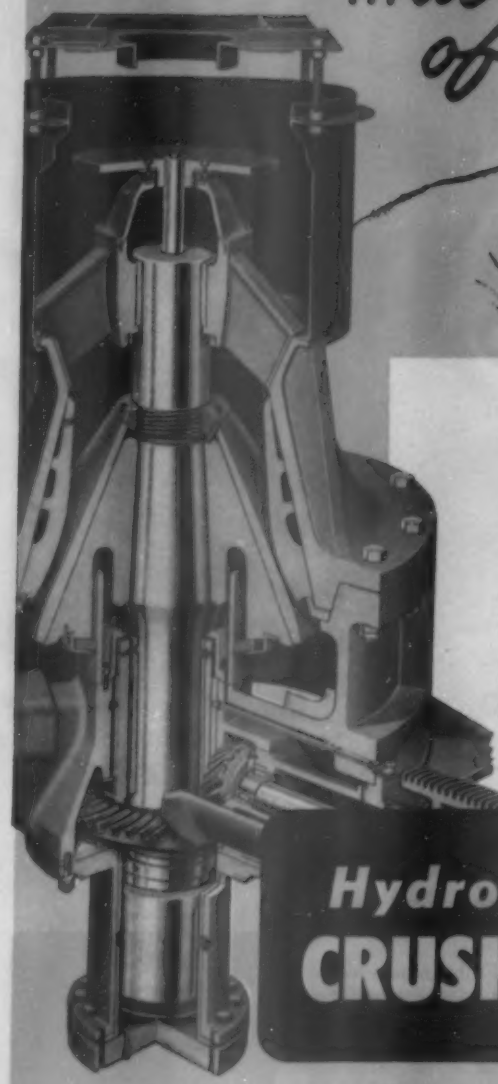
For More Than 50 Years The Greatest Name In Trucks

FIRST CHOICE White OF THE "PROS"

Specification Stone

...at the flip of a switch





YOU'RE ALL SET TO MEET the rigid specifications of highway and other construction contracts with a *Hydrocone* crusher . . . the crusher that affords one-man, one-minute product control.

In this truly modern crusher, *Hydroset* control provides a rapid and convenient means of raising and lowering the hydraulically supported crushing mantle. Adjustment to precise product size can be accomplished by the flick of a switch. Compensation for wear can be done in the same manner. In addition, *Hydroset* control facilitates emptying crushing chamber in case of power failure or other emergency.

Hydrocone CRUSHERS

For complete information, see your local A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 07B7145B.

Produces a Cubical Product

The *Hydrocone* crusher also helps you meet specifications by producing a uniform, cubical product because of its small eccentric throw in relation to crusher setting. Fines, slivers and flats are kept to a minimum because of the smaller effective ratio of reduction during each crushing stroke. With a small eccentric throw, the open side setting is also smaller. This results in a smaller top size product.

Hydrocone and Hydroset are Allis-Chalmers trademarks. A-4653

ALLIS-CHALMERS

IN THE CRUSHED STONE INDUSTRY, TORRINGTON *Bearings are used in many applications including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.*

TORRINGTON Spherical Roller Bearings

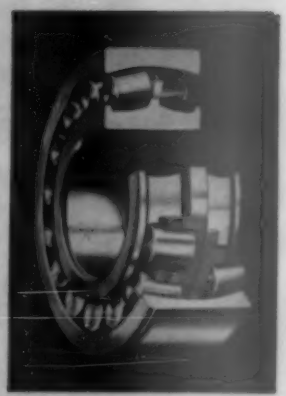
are manufactured with accurate geometrical conformity between races and rollers for ultimate capacity and performance.

Because conformity factors are uniformly high, rollers can operate with a minimum of friction and carry greater loads for a longer time.

There are other good reasons why TORRINGTON SPHERICAL ROLLER BEARINGS can guarantee superior performance. Races and rollers are precision ground to a high surface finish from the finest quality electric furnace steel available.

An integral center flange on the inner raceway gives positive radial and thrust stability against continuous high-speed, high-load conditions. Fully machined, cast-bronze, land-riding cages—one for each path of rollers—allow thorough lubrication, reduce wear and lengthen bearing life.

Specify dependable, rugged TORRINGTON SPHERICAL ROLLER BEARINGS in your equipment. They're available with either straight or tapered bore for shaft or adapter mounting.



THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

Jalloy Plates outlast other steels by margins of 4 to 1

Jalloy lowers maintenance costs on ore and coal conveyors

Jalloy provides longer wear with less repair in truck bodies

Jalloy Aprons in Tyrock screen last 3 times as long as other steels

FACING A TOUGH PROPOSITION?

you can beat it with JALLOY

Only a seasoned hunter with the right equipment can stand up to a charging rhino. And, likewise, only a special steel like JALLOY can withstand severe impact and abrasion . . . day after day. In comparison with mild steels as well as other abrasion-resistant steels, JALLOY gives outstanding results when heat-treated to your specifications.

This modern heat-treated plate brings savings in steel costs, maintenance, and repair, and also is easily welded. JALLOY is available in three grades, each of which is designed for specific applications.

J&L STEEL

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Jalloy heat-treated steel plate beats wear due to impact and abrasion

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 481, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

HOW TO BUY CONVEYOR BELTS

and get...
MORE USE PER DOLLAR
where
SPECIAL ENGINEERING
is needed

Look for a make of belt backed by experienced, specialized engineering service.

Selecting the right conveyor belt to solve a special problem begins with selecting the right representative . . . one who will take interest in your particular belt needs and refer your problems to his factory if engineering help is required. Where a company makes a wide selection of conveyor belts for many applications, the representative can often recommend a feature construction to meet your job requirements. Where your problem is unique, that company backs its field men with custom engineering and comes up with a recommendation to meet your specific operating conditions.

Choose the company that offers *complete* belt engineering service . . . the source of supply that maintains close contact between factory and field.

RAYBESTOS-MANHATTAN CONVEYOR BELT ENGINEERING

A leading steel mill, faced with handling hot sintered ore without an insulating layer of "fines", had numerous belt failures due to charring.

An R/M representative called in a factory engineer. A new custom-engineered R/M conveyor belt with special cover now saves hundreds of dollars a year at the mill.

and . . . where hot ash and clinker was wearing out a conveyor belt every month at a Michigan cement plant, an R/M field man was able to furnish a specially engineered Homocord Belt which has outlived the best previous belt four times over.

and . . . special, "chevron cleated" conveyor belt was developed by R/M, as a result of a field representative request, to replace a smooth surfaced belt unable to carry wet iron ore up a mine slope without costly spillage.

These are just a few of many instances where R/M engineering service has solved conveyor belt problems. In other cases, special job requirements have been met with R/M's exclusive constructions such as extra-flexible Ray-Man "F" . . . extra-cushioned Homocord for shock-loading . . . and Ray-Man Tension-Master for extra-high tensions and long lifts.

Let an R/M representative show you why R/M engineering makes R/M Conveyor Belts last much longer . . . give you "More Use per Dollar".

RM-602-BB

R/M

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

Need 400 tons of 1¼" aggregate per hour, with crushing 20%?
. . . 250 tons per hour of paving stone?
. . . 300 tons per hour of crusher run limestone?

CEDARAPIDS has the answer

The Commander, big-volume producer of fine crushed aggregate, is the answer to profitable operation in pits with high percentages of fines. Maintenance costs are low.

Portable Primaries turn 100% of pit run material—even big boulders—into specification product. Use ahead of any make gravel plant for profitable rock crushing.

Cone Crusher Secondary combines Cedarapids portability with Symons® Cone Crusher's low-cost output of the hardest or most abrasive rock or gravel.

Single Pass Plants for low-cost crushing units where material does not have to be accurately graded, and for jobs where portability and fast set-up are important.

Hammermill Secondary Plant, a complete gravel crushing and screening plant, produces roadrock or aglime or a percentage of both at the same time.

Portable Double Impeller Impact Breakers are ideal primary units for use ahead of secondary crushing plants. Use alone for high capacities of desirable cubical shaped aggregate.

Jaw Crushers—15 sizes enable Cedarapids engineers to select the right size for your job. Single jaw and twin jaw models are available.

Horizontal Vibrating Screens in a wide range of sizes in single, double and triple deck models, assure high capacities of accurately graded aggregate.

Roll Crushers, in eight sizes with three types of roll shells, insure high capacity of the smaller sized finished products you want.

IOWA
MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U.S.A.
Gentlemen: My next job is _____

☐ Please send details of the Cedarapids equipment you recommend.

Name _____
Title _____
Company _____
Address _____
City _____ Zone ____ State _____

"IDEAL" aggregate for Florida market

TELSMITH

designed Miami plant of IDEAL Crushed Stone Co., produces 400 tons per hr. crushed limerock and sand.

Telsmith 30" x 25' Twin Screw Sand Classifier.

•

Telsmith 5' x 12' double deck special heavy-duty Vibro-King Screen.

● With a capacity of over 400 tons per hr; 60% rock, 40% sand; this Telsmith-designed plant makes 6 sizes: ¾" to 2½" ballast; 1"-¾", ¾"-½", ½"-⅜", ⅜"-⅜6" rock; ⅜6" sand. A 4½-yd. dragline digs the raw material; self-dumping barges transport it to plant.

● Ballast goes to railroads. Aggregate qualifies for Florida State, County, and City specs; U. S. Army Engineers; ready-mix, concrete-block, and concrete pipe plants. Send for Bulletin 266.

Q-32

PLANT EQUIPMENT—Two 60" x 8' Heavy Duty Plate Feeders • 5' x 12' Special Heavy Duty Vibro-King Scalper ahead of 30" x 50" single roll primary crusher • 5' x 12' 2-deck Vibro-King Scalper ahead of reversible impactor secondary crusher • 5' x 12' 2-deck and 5' x 14' 3-deck Vibro-King Finishing Screens for rock sizing • 2' x 8' 1-deck Vibro-King Screen for fine sand • 30" x 25' Twin Screw Sand Classifier for coarse sand • 24" x 20' Single Screw Sand Classifier for fine sand • All Telsmith except crushers.

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Representatives in Principal Cities in All Parts of the World • Cable Address: Sengworks, Milwaukee

✓ happy balance between dependable performance and moderate cost

ROLLWAY STEEL CAGE ROLLER BEARINGS

Tru-Rol *precision, steel-cage, heavy-duty bearing with contoured guide lips assuring true right-line rolling, maintained roller alignment and thin oil film.*

● Rollway's *TRU-ROL* Steel-Cage Bearings afford wide latitude in balancing *dependable* performance, *long* life, and *high load* capacity against *moderate* cost. They rate high in any comparison on a cost-performance basis.

A choice of stamped steel retainers with contoured guide lips, or steel segmented retainers assure true rolling and an evenly distributed *thin* oil film — *big factors in reducing power losses and heating.*

TYPE D

Rollway Metric Series Steel Cage Roller Bearings

● Rollway Metric Series Steel-Cage Bearings offer the greater load capacity of solid cylindrical rollers, plus the true right-line rolling of trunnion rollers turning in a rigid steel cage. There's no roller skew, no pinch out, no cam action. Design permits maximum bearing capacity . . . within small space . . . at moderate cost.

"Crowned" Rollers Relieve End Stress

TRU-ROL offers the extra advantage of a finish-ground "crown" radius on the roller ends. That relieves high end-stress and insures uniform load distribution over the entire length of the roller. The result: *TRU-ROL* Steel Cage Bearings carry heavier loads over longer periods without excessive end-fatigue. They are less affected by slight misalignment or shaft deflection.

Investigate *TRU-ROL* Steel Cage Roller Bearings before selecting any bearing in the medium price range.

FREE CATALOG

ROLLWAY BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ROLLWAY BEARING CO., INC.
573 Seymour St., Syracuse 4, N.Y.

Please send a free copy of New Tru-Rol Catalog with extra Alignment Charts.

Name_____ Title_____

Firm Name_____

Street_____

City_____ Zone_____ State_____

ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Milwaukee • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

"The EAGLE sand screw with coal removing attachment has been working satisfactorily for the past 2 years"

A large sand and gravel company, operating a number of plants in Illinois, encountered difficulties from coal in their deposit at one of their plants.

Several years ago they installed an Eagle Double Screw Coarse Material Washer-Dewaterer with *Coal Remover Attachment* which solved their problem by removing 98% of the coal from -¾" +⅛" material according to their report.

If coal or lignite in your material is preventing you from meeting specifications, investigate the Eagle Screw Unit with Coal Remover Attachment—actually gets out the coal at lower cost than more expensive, complicated equipment. Does a thorough washing job too. If shale, chips, or water logged debris are your problem, there's an Eagle Shale Remover or Trash Remover attachment to solve your problem.

Send a 25-lb. sample of your material—let experienced Eagle Engineers run a test, give you a report and make recommendations without obligation. Eagle pioneered in the design and construction of aggregate washing and classifying equipment—has the "know how" to solve your problem and the equipment to do the job—plus a nationwide network of Factory-Trained Distributors.

THE EAGLE LINE

COARSE MATERIAL WASHERS

FINE MATERIAL WASHERS

LOG WASHERS

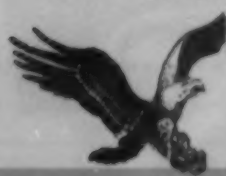
WATER SCALPING—CLASSIFYING TANKS.

"SWINTEK" DREDGE LADDERS

CUTTER HEADS

COMPLETE DREDGES

BREAKER BALLS & PILE HAMMERS.



Send for your copy of Catalog 55

EXPERIENCE, PROGRESS, SERVICE.. SINCE 1872

EAGLE IRON WORKS

137 HOLCOMB AVE., DES MOINES, IOWA

*Users name on request.

EDITOR'S PAGE

National Slum Clearance Program Will Create Enormous Markets

AMERICAN COUNCIL TO IMPROVE OUR NEIGHBORHOODS, which is spearheading a national program of housing renewal, represents the first total approach to one of this country's major problems. ACTION, as it is called for short, is a non-partisan, non-profit organization, backed by national leaders from many walks of life. It seeks to stamp out decay and blight of communities through the improvement of homes and the elimination of substandard housing and slums.

A program of the magnitude of this one, which is to be translated right down into local community action, will affect, either directly or indirectly, many producers of rock products and concrete products. Many millions of dollars are being donated by public-spirited individuals, organizations and industries to alert citizens to their responsibilities to their communities and the need for improvement of their own homes as part of the total effort. A combination of housing research, information and education and a field service organization as liaison between the national effort and local action are cogs in the program.

Geared to Communities

Producers in these industries stand to gain from expanded markets that will be created for their products. They may have a golden opportunity to cooperate in a most worthwhile effort and entrench themselves in their communities through this most unique opportunity to build good public relations.

The goal is substantial and envisions an outlay of one hundred billion dollars in addition to current expenditures for housing over a ten-year period to upgrade substandard homes, to clear out and replace slums and for local improvements.

Of the total, 40 billion dollars would be needed for improving below-standard housing to safe, sanitary and convenient living and it would take 50 billion dollars to clear out and replace slums which are beyond salvage.

The drive is gaining momentum now and will be launched in earnest through cooperation of the Advertising Council which has accepted the program as a public service campaign. Time and space worth millions of dollars are being donated by advertisers and cooperating media.

It is in plans for working directly with communities that opportunity is afforded producers of rock products to cooperate and thereby profit. Support of local organizations is sought in accomplishing the job and citizens are to be urged to join up into local better housing groups in their neighborhoods to combat substandard housing.

Among the plans of ACTION is a service of suggesting specialists for consultation and advice at the community level on matters of administration and legislation. Not only will the support and participation of industry be needed but there may be required credit improvement and certainly political endorsement.

Economic Effects

Successful fulfillment of the goal, to eliminate slums in ten years and thereby improve health standards and reduce crime as social benefits, would result in significant economic changes affecting localized industries. There would be new business created for suppliers of building materials, not only for homes but, conceivably for streets, commercial structures and municipal improvements.

This would come about through stabilizing the economy of communities and particularly in large metropolitan centers. Almost every large city has been drifting toward bankruptcy because of failure to conserve housing and allowing blight to spread. These cities just do not have the money to maintain adequate standards of municipal service, to pay required salaries and to provide needed schools, hospitals and roads.

Thus, the economy founded on the city concept is being threatened which is evident from the mass exodus of people to suburban areas. This flight of the middle-classes across city lines, followed by stores and new industries, is eating away the tax base of the cities, leaving behind the poorer segments in spreading slums.

These conditions can be licked if the effort be properly supported. A good example is the "Baltimore Plan" of slum clearance under which many thousands of substandard buildings have been restored at a cost to the city of only a fraction of a cent per capita. Local industries cooperate in that program, recognizing their responsibilities and economic stake in a sound city government.

Participation by producers of rock products and concrete products in the ACTION cause could have many benefits. It would help create new markets and protect outlets for operations otherwise threatened by virtue of location. It would be a show of high-minded community spirit and be an opportunity to demonstrate importance of such operations. Cooperating plant operations could further participate by cleaning up their own operations and removing sources of complaints that would then classify such operations as good neighbors.

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Symposium on Chemistry of Cement—I

ROCKY'S NOTES

NATHAN C. ROCKWOOD

THE THIRD INTERNATIONAL SYMPOSIUM on the Chemistry of Cement was held in London, England, in the latter part of 1952, under the auspices of The (British) Building Research Station, the Department of Scientific and Industrial Research, and the Cement and Concrete Association. The *Proceedings** were published late in 1954, and distributed in the United States about the middle of 1955. That accounts in some measure for lateness of this review, but there is another reason; we wished to become as familiar as possible with the text. This volume contains 870 pages.

There are 22 formal papers in the book, contributed by research specialists from France, Sweden, Italy, Canada, Germany, Switzerland, Denmark, Great Britain and the United States. Those participating for our own country included Dr. Allen Bates, vice-president of the Portland Cement Association (not present in person); Dr. R. H. Bogue (then head of the P.C.A. Fellowship at the National Bureau of Standards); Dr. Herbert Insley, National Bureau of Standards; Terry F. Newkirk (not present in person), P.C.A. Fellowship, National Bureau of Standards; Dr. Fred Ordway (not present in person), P.C.A. Fellowship, National Bureau of Standards; Dr. Harold H. Steinour (not present in person), P.C.A.; Dr. Geo. L. Kalousek, University of Toledo, Ohio; Dr. W. C. Hanson, Universal Atlas Cement Co.; Charles E. Wuerpel, Marquette Cement Manufacturing Co.; Myron A. Swayze, Lone Star Cement Corp. Dr. W. H. Eitel, University of Toledo, contributed to the discussion, but was not present.

The five days of meetings were divided into five sessions, during which the subjects discussed were (1) Introductory addresses and history of cement; (2) Constitution of Portland Cement; (3) The Setting and Hardening of Portland Cement; (4) Special Cements; (5) Applications of Research. The sixth day was devoted to inspection trips. Since the history of portland cement, or the British version of it, is well known, we will start our review with a paper by Dr. F. M. Lea, director of Building Research, Department of Scientific and Industrial Research, Great Britain.

*Published by the Cement and Concrete Association, 52 Grosvenor Gardens, London, SWI, price $9.20.

Future Research

Dr. Lea's paper was entitled "Cement Research and the Future." One statement in his paper is of special interest to us: "The complex polymorphism of tri-calcium and di-calcium silicates appears at last to be resolved and we know much about the way in which minor components in solid solution stabilize the different forms of these compounds [in clinker]. This leads us to the interesting question of the relative rates of hydration of the different polymorphic forms and whether, for instance, the reactivity of di-calcium silicate clinker can be increased. The technical advantage this would have is self-evident."

For those who have forgotten, polymorphism means the same substance chemically with two or more different crystal organizations or lattices. Our interest is in the suggestion that it appears to be generally accepted by the experts that a more rapidly hydrating dicalcium silicate would greatly improve portland cement. In regard to portland cements containing blast-furnace slag, he says: "Some slag glasses are inert, others are hydraulic in an alkaline medium, and still others are self-hardening."

The nature of set cement is disposed of by Dr. Lea in these words: "It has become a commonplace remark that the old controversy of the 'gel' versus 'crystalline' theory of cement setting has largely been resolved by the knowledge that the substance of set cement is crystalline, but of colloidal dimensions. It now seems, however, that the process of crystal growth may be an important factor in determining the properties of the set mass. Most of the hydrates can form fibrous or lath-like felted masses. If this is the key point in determining the strength, then an interesting field of research is opened up. It is well known that small quantities of impurity will often modify profoundly the habit of growing crystals, and it seems possible that substances might be found either to accentuate or destroy the fibrous character of set cement, with corresponding effects on the physical properties."

From that we assume that the crystalline character of the cement gel is sufficiently established, although elsewhere, Dr. Lea says that the crystals are very fine, and that even in "so-called completely hydrated cements" enough of the original clinker [unhydrated] remains to give a dominating X-ray pattern. A material may be crystalline and a gel at the same time, but it is not then an "amorphous gel" as we referred to cement gel in our August issue, p. 150. We took the point of view that while crystals of hydrated calcium silicates *could* be formed in dispersed or dilute solutions, there was no evidence of such crystals in set cement pastes. Apparently we were in error as regards modern technical evidence and theory.

Tricalcium Silicate

Dr. J. W. Jeffery, Birkbeck College Research Laboratory, University of London (England), presented a paper "The Tricalcium Silicate Phase," in which he discussed the polymorphism and structure of C_3S, strength development and clinker composition. He accounts for the chemical activity of C_3S as "the irregular co-ordination of the calcium ions and the 'holes' adjacent to these ions." This irregular co-ordination gives rise to a distortion of the electrostatic field between the ions, so that C_3S necessarily has a high lattice energy. That is to say, it has a potentially high chemical activity.

That there are still unsolved problems in connection with C_3S, or alite, as it occurs in portland cement, was emphasized by Dr. Jeffery in his closure to the discussion. He said that he did not believe "solid solution" of MgO and Al_2O_3 in C_3S was the correct way of describing it. He suggests that true description is a substitution of the silicon ions by aluminum ions; in one substitution a monovalent positive ion comes into a nearby hole in the lattice to balance the charges, or with a double substitution, a divalent positive ion. It is the inclusion of MgO substituting for CaO that provides the known lattice (X-ray) of alite.

Dicalcium Silicate

Dr. R. W. Nurse, Building Research Station, Great Britain, presented the paper "The Dicalcium Silicate Phase." He said that in the temperature range from 0-1600 deg. C. there are now well established four polymorphic forms of dicalcium silicate. It is the β form that occurs most in portland cement, and its crystal structure or lattice has been determined. Among oth-

(Continued on page 96)

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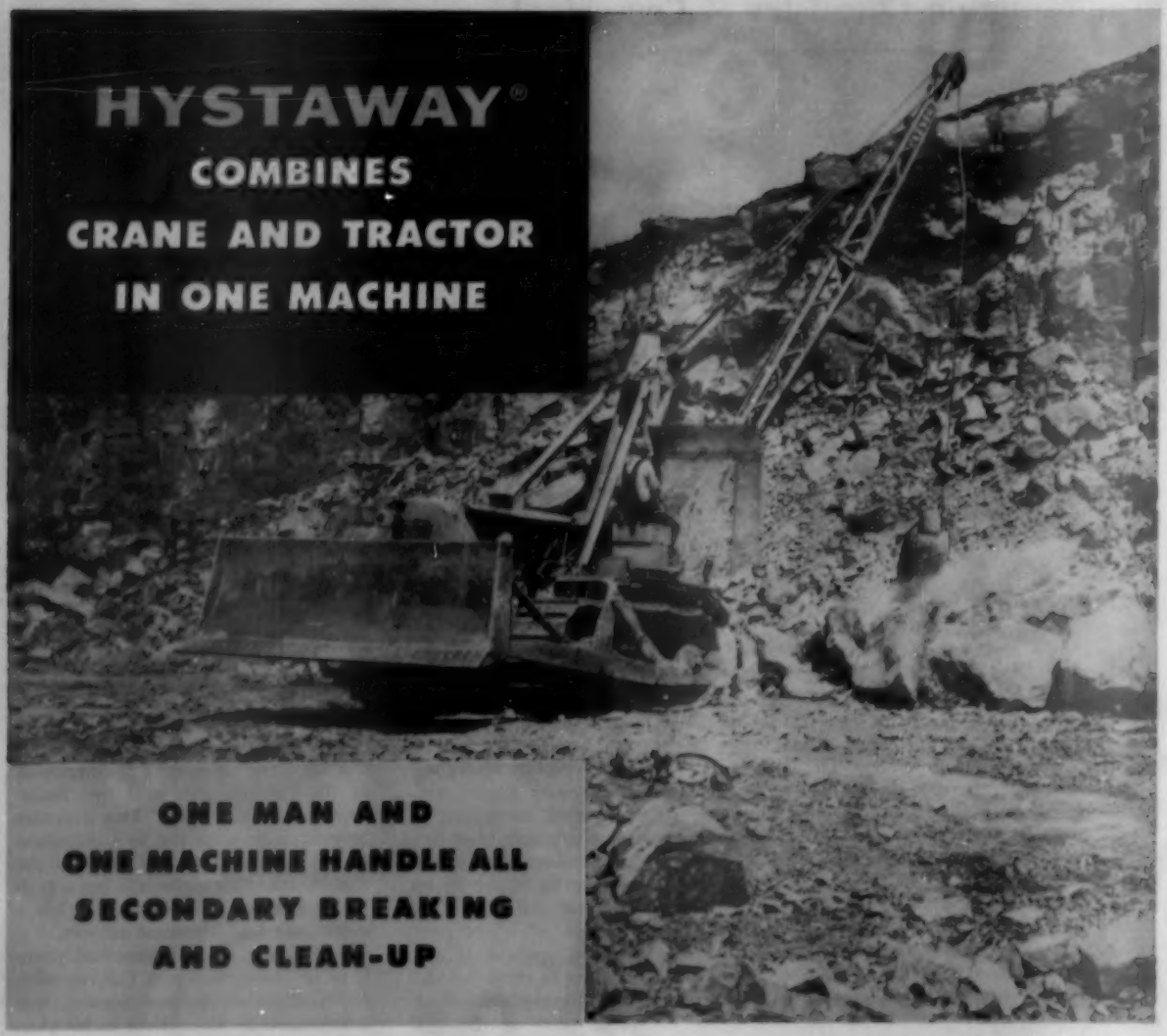

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LABOR RELATIONS TRENDS

By NATHAN C. ROCKWOOD

Attempt to Shut Off Ready Mix Fails

A CASE OF SECONDARY BOYCOTT, that can readily happen to any of our producer readers, was decided by the National Labor Relations Board under date of September 9, 1955. It wrote the sequel to an attempt by union labor bosses to compel a construction contractor to unionize 100 percent by cutting off his supplies of sand and gravel, ready-mixed concrete and concrete block. These suppliers had no current controversies with their own employes, or with the unions representing them, yet every attempt short of force was made to keep them from supplying the contractor.

The case in point was in connection with the Seattle (Wash.) District Council of Carpenters, affiliated with the United Brotherhood of Carpenters and Joiners of America, A.F. of L. and the Cisco Construction Co. The construction contractor had two contracts with the United States Army Engineers for guided missile launching and control areas at Redmond and Young's Lake, near Seattle. The construction contractor was not unionized, but paid wages pursuant to the terms of its contract with the Federal Government, and in compliance with Davis-Bacon Act.

On October 20, 1954, a business agent of the Carpenters' Union appeared on the job and demanded union shop, increased wages and other benefits. The employer said he would comply *if* the union would get the Army Engineers to change the terms of his contract. Of course, this couldn't be done, and on October 28 pickets were placed around the two job sites, carrying signs which in substance declared the contractor had unfair wages and working conditions.

The contractor had made contracts with the Cadman Gravel Co. for ready-mixed concrete for the Redmond job and with the Western Sand and Gravel Co. for the Young's Lake job, and with Layrite Concrete Products of Seattle for concrete block for both jobs.

Concrete Deliveries

On November 2 or 3 the prime contractor, the Cisco Construction Co. ordered ready-mixed concrete deliveries from the Cadman Gravel Co., but the truck drivers, as teamster union members, refused to cross the picket line. Anticipating such an outcome, the Cisco Construction Co. entered an oral agreement with the Western Sand and Gravel Co. to lease some of its mixer trucks to haul concrete from the Cadman plant. Upon arrival at the Cadman plant the Western truck drivers showed some of Cisco's own employes how to manipulate the truck mixers. Thereafter, Western truck mixers were loaded at the Cadman plant and driven through the picket line by Cisco employes.

The Carpenters' union then attempted to picket the Cadman plant and to follow and annoy the mixer truck drivers to and from the job. That is substantially the story up to the time the case was presented to an examiner of the N.L.R.B. Subsequently it came before the full board for review and decision; and what follows is in the language of the N.L.R.B.'s report.

"We agree with the Trial Examiner that the Respondents have jointly and severally violated Section 8 (b) (4) (A) of the Act. We base this finding on the following conduct attributable to the Respondents:

"(a) Respondent Carpenter's picketing at Cadman's between November 5 and 17, 1954, and at Western Sand and Gravel on November 15 in connection with its dispute with Cisco.

"While we accept the Trial Examiner's finding that Respondent Carpenters picketed Cadman and Western Sand and Gravel at times when Cisco trucks were not on their premises, we do not rest our conclusion herein on that fact alone. It appears from the record that the dispute in this case between the Respondent Carpenters and Cisco concerns employes of Cisco who are employed at the Redmond and Young's Lake job sites in the state of Washington where Cisco is engaged as the general contractor. The primary sites of the dispute could be and are in fact being picketed by Respondent Carpenters, as they have been virtually since the beginning of the dispute. In view of these facts, more fully detailed in the Intermediate Report, we find, for the reasons stated in Washington Coca Cola and related cases, that *all* the Respondent Carpenter's picketing of Cadman and Western Sand and Gravel was conducted, at least in part, to force those secondary employers to cease doing business with Cisco, by inducing and encouraging their employes to engage in a strike or concerted refusal to work, in violation of Section 8 (b) (4) (A) of the Act.

"(b) The instructions by Abbott, assistant business representative of Respondent Local 302, to Cadman employes who were members of Respondent Local 302, on November 8, that they were to cross the street to where he would be and talk to him when Respondent Carpenters' pickets were on the scene.

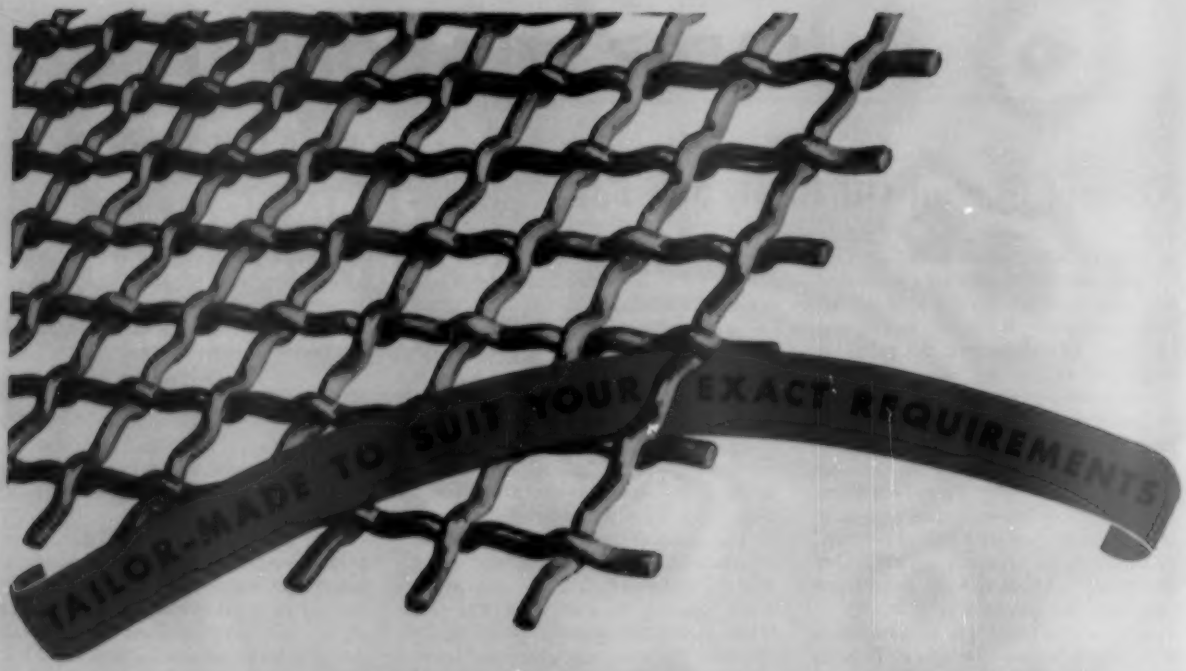
"(c) The attempts by Lucero, assistant business agent of Respondent Local 440, between November 29 and December 4, to persuade Layrite employes who were members of his union not to load Cisco trucks, including his threat, on December 4, to call them up for disciplinary action if they did.

"(d) The 'suggestion' by Crowder, business agent of Respondent, Local 174, to Forcier, a Cadman employe, on November 5, that he go home, while at the same time referring to the fact that Forcier was working behind a picket line and threatening Forcier with the loss of his withdrawal card in Respondent Local 174.

"Respondent Local 174 [Teamsters] contends that this activity on the part of Crowder was 'directed at a single employe' and that, because the incident constituted the only direct action taken by it against an employe of a secondary employer, it was not an attempt to induce employes to engage in a 'strike' or a 'concerted' refusal to perform work, within the meaning of Section 8 (b) (4). This contention is without merit. For reasons set forth hereinafter, we believe, as already indicated, that the above-enumerated activity engaged in by each Respondent was part of a joint course of action participated in by all the Respondents herein. In view thereof, it would be manifestly unrealistic to consider the Crowder incident in isolation rather than as part of the total pattern of conduct engaged in by the Respondents in connection with this controversy. And when, under the circumstances of this case, the incident in question is viewed as but one of a series of related events, the fact that only one employe figured in it becomes wholly immaterial.

"In attributing responsibility for the foregoing incidents to the Respondents we are persuaded not only by the re-

(Continued on page 130)



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PEOPLE

IN THE NEWS

Black Heads Arundel Corp.

C. WARREN BLACK, executive vice-president of the Arundel Corp., Baltimore, Md., since 1952, has been elected president of the firm to fill the vacancy caused by the recent death of Richard A. Froehlinger. Mr. Black was associated with the Arundel Sand and Gravel Co. in 1919, at which time it was merged with the newly formed Arundel Corp. After serving as chief engineer for a number of years, Mr. Black became vice-president in charge of engineering construction in 1940, advancing to executive vice-president in 1952. He has been a director and a member of the executive committee since 1943. He is also a director and vice-president of Arundel-Brooks Concrete Corp. and the Maryland Slag Co. Born in Baltimore, Md., Mr. Black attended Baltimore Polytechnic Institute, received a civil engineering degree from Johns Hopkins University, Baltimore, Md., and graduated from the United States Army Engineering Officers Training School.

Assistant Plant Manager

JAMES E. JENKS, formerly assistant plant manager at the Fairborn, Ohio, plant of Universal Atlas Cement Co., New York, N. Y., has been appointed assistant plant manager at the Universal, Penn., plant. A native of Bristow, Okla., Mr. Jenks graduated from the University of Texas, Austin, Texas, with a degree in mechanical engineering. After three years' service in the U. S. Army, Mr. Jenks joined the Fairborn plant as an engineering trainee in 1948. He was appointed process engineer and then project engineer. He has been assistant plant manager at Fairborn since 1954.

James E. Jenks

Assistant Plant Manager

AL DENE MULLIN, formerly general operating foreman at the Leeds, Ala., plant of Universal Atlas Cement Co., New York, N. Y., has been appointed assistant plant manager at the plant. A native of Phenix City, Ala., Mr. Mullin graduated from Alabama Polytechnic Institute, Auburn, Ala., in 1942, where he received his B.S. degree in mechanical engineering. After four years' service in the U. S. Army during World War II, Mr. Mullin returned to the Leeds plant as mill practice engineer. He was promoted to plant engineer in 1947, and two years later was transferred to Duluth, Minn., plant as plant engineer, returning to Leeds in 1951 as general operating foreman.

Al Dene Mullin

Joins Virginia Ready-Mix

N. T. RYKKEN has been appointed general manager of the Virginia Ready-Mix Concrete Co., Virginia, Minn. He has been manager of Whitney's, ready-mixed concrete firm of Duluth, Minn., for the past seven years. A native of Minnesota, Mr. Rykken is a graduate of the University of Minnesota with a M.S. degree in civil engineering. He is secretary-treasurer of the North Central Ready-Mix Association and a national director of the National Society of Professional Engineers. He is a member of the American Concrete Institute and the American Society of Civil Engineers.

Minerals Engineer

LAWRENCE A. ROE has been appointed minerals beneficiation engineer of the engineering division of International Minerals and Chemical Corp., Chicago, Ill., according to Thomas M. Ware, vice-president in charge of the division. Mr. Roe, who has had 18 years' experience in the chemical and mineral beneficiation field, was formerly associated with the Bjorksten Research Laboratories, Madison, Wis. He has served in the minerals beneficiation division of Battelle Memorial Institute, Columbus, Ohio, and at the Trona, Calif., plant of American Potash and Chemical Corp. Mr. Roe is a graduate of the Missouri School of Mines and Metallurgy, Rolla, Mo., and author of numerous technical papers.

Vice-President of Operations

CHARLES E. MARSHALL, vice-president, Texas Industries, Inc. Dallas, Texas, has been promoted to vice-president in charge of operations. A native of New York and a graduate of Yale University, New Haven, Conn., Mr. Marshall joined Texas Industries in 1951, after two years' service as Deputy Chief of the ECA Mission in Western Germany and as Deputy Di-

Charles E. Marshall

rector of the office of Economic Affairs, Allied High Commission in Frankfort, Germany. He became a vice-president in 1952. Prior to his present appointment, Mr. Marshall was in charge of the firm's concrete operations in Fort Worth.

I.M.C.C. Appointments

DR. ROGER BART has been appointed manager of the research experiment station, Mulberry, Fla., of International Minerals and Chemical Corp., Chicago, Ill. W. B. Williams has been named supervisor of chemical process development and F. N. Oberg has been appointed supervisor of coordinating services.

Dr. Bart joined the experiment station as chemical engineering group leader in 1951. For the past two years he has been supervisor of chemical process development. He is a member of the American Chemical Society and American Institute of Chemical Engineers. He received his doctor's degree from the Massachusetts Institute of Technology, Cambridge, Mass., where he was an instructor.

Mr. Williams, who has been chemical engineering section leader, joined the research division staff in 1953. He is an engineering graduate of Alabama Polytechnic Institute, Auburn, Ala.

Mr. Oberg has been associated with the chemical engineering and ore dressing departments of the research division since 1952. He was formerly with American Cyanamid Co., and M.I.T., where he worked on uranium recovery processes. He holds a B.S. degree in metallurgical engineering from South Dakota School of Mines and Technology, Rapid City, S. D.

Heads Cleveland Quarries

DR. JACOB O. KAMM, director and executive vice-president of Cleveland Quarries Co., Cleveland, Ohio, has been elected president of the company and its subsidiary, Silica Chemicals, Inc. Dr. Kamm resigned in 1953 as professor of economics and director of the School of Commerce of Baldwin-Wallace College to join Cleveland Quarries Co. and Silica Chemicals, Inc., as vice-president, subsequently becoming executive vice-president. He succeeds William M. Jones, who has resigned.

Assistant to President

W. J. PARTON has been appointed assistant to the president of The General Crushed Stone Co., Easton, Penn. He was formerly president of Lehigh Navigation Coal Co. and president and chairman of the board of the Panther Valley Coal Co. Mr. Parton is a graduate mining engineer of Pennsylvania State University, received his M.S. degree from the University of Washington, Seattle, Wash., and was awarded the professional degree of engineer of mines by Pennsylvania State University. He is a member of the American Institute of Mining and Metallurgical Engineers, American Institute of Management and the Pennsylvania Society of Professional Engineers.

National Gypsum Superintendent

MAX W. ABRAM has been appointed mine superintendent at the Shoals, Ind., plant of National Gypsum Co., Buffalo, N. Y. Born in Lyons, Indiana, Mr. Abram graduated from Purdue University, Lafayette, Ind., with a B.S. degree in electrical engineering, and was associated with the Tennessee Valley Authority from 1940 to 1942. After four years as captain in the U. S. Air Force, he became assistant mine superintendent for the Templeton Coal Co. He joined National Gypsum Co. as project engineer in 1954.

Heads Georgia Marble Firm

JOHN W. DENT has been elected president of The Georgia Marble Co., Tate, Ga., and John Dent has been made chairman of the board to succeed James R. Cowan who passed away recently. Frank C. Owens, president of Draper-Owens Co., Atlanta, Ga., and Mrs. Margaret Tate Benton, Monticello, have been named directors.

Completes 25 Years' Service

EMMETT J. NORRIS, JR., credit manager and assistant treasurer of Calaveras Cement Co., San Francisco, Calif., was recently presented a gold watch by William Wallace Mein, Jr., president, in honor of his completion of 25 years of service with the company. Mr Norris joined Calaveras in 1930 as an accounting clerk, advancing to chief accountant and then to assistant treasurer.

Emmett J. Norris, Jr.

President of Alton Brick

CHARLES J. SCHOTT has been elected president of the Alton Brick Co., Alton, Ill., which was recently purchased by the Walter E. Schott Co., Cincinnati, Ohio. He succeeds Eben Rodgers, Jr., whose family founded the brick company in 1892. Other new officers are Walter E. Schott, Jr., vice-president; Frank X. Homan, vice-president; and Howard J. Van Den Eynden, secretary. Local management of Alton Brick Co. remains unchanged with T. W. Ryan as vice-president and general manager; C. J. Weaver, treasurer; Robert Harries, chief accountant, and J. W. Brookhart, general sales manager.

Great Lakes Carbon Managers

KIRK E. HAZELTON has been promoted from operations manager to assistant general manager of the perlite division of Great Lakes Carbon Corp., New York, N. Y. Located at Florence, Colo., he will continue in charge of mining and processing, in addition to his new sales and administrative duties. William R. Howell, who was regional sales manager in the Chicago area, has been appointed general sales manager of the perlite division, and will continue as chairman of the New Uses Committee of the Permalite franchisees' marketing organization.

Kaiser Gypsum Vice-President

VICTOR E. COLE has been appointed vice-president and assistant general manager of Kaiser Gypsum Co., Inc., Oakland, Calif. He has been associated with the Kaiser organization for 15 years, starting at the Richmond shipyards. He joined the gypsum company in 1953 as assistant to the vice-president and general manager. Born in Long Beach, Calif., Mr. Cole received his B.S. degree in civil engineering from the University of California, Berkeley, Calif.

Permanente Vice-Presidents

JAMES K. BEATTY, Paul E. Rogers, John M. Garoutte and Peter S. Hass have been appointed vice-presidents of Permanente Cement Co., Oakland, Calif. James K. Beatty, formerly general sales manager, has been made vice-president in charge of sales, cement division; Paul E. Rogers, formerly controller, is vice-president and controller; John M. Garoutte, formerly works manager at the Permanente plant, has been named vice-president, in charge of operations, cement division; and Peter S. Hass, formerly as-

sistant to the vice-president and general manager, has been appointed vice-president and assistant general manager, cement division.

Mr. Beatty joined the Kaiser organization in 1938 as junior engineer for Consolidated Builders, during construction of Grand Coulee Dam. He transferred to Permanente Cement Co. as salesman in 1940, and was made general sales manager in 1946. Mr. Beatty was born in Manila, Philippine Islands.

Mr. Rogers became associated with Henry J. Kaiser Co. in 1931 as an accountant. In 1944, he was transferred to Permanente Cement Co. as administrative manager and was made controller in 1947. A native of Oakland, Neb., he is a graduate of the University of Nebraska, Lincoln, Neb.

Mr. Garoutte joined Permanente Cement Co. in 1940 as an engineer. He was transferred to Kaiser Aluminum and Chemical Corp. in 1941, where he became works manager of the Moss Landing, Calif., plant and then the Baton Rouge, La., plant. He returned to Permanente in 1948 as works manager of the Permanente cement plant. Mr. Garoutte was born in Chico, Calif.

Mr. Hass became associated with Permanente Cement Co. in 1947 as an engineer. After six years at the cement plant, he was made assistant works manager and then transferred to the Oakland office as assistant to the vice-president and general manager. Born in Davenport, Iowa, Mr. Hass holds a B.S. degree in chemical engineering from Stanford University.

Association Director

JOHN QUINCY ADAMS, vice-president and treasurer of Bessemer Limestone and Cement Co., Youngstown, Ohio, has been elected a member of the board of directors of the National Association of Credit Men. He will represent District 7, which includes Ohio and Kentucky and parts of Tennessee, Indiana and Michigan. Mr. Adams has served as president, vice-president, director and councilor of the Youngstown Association of Credit Men in the 26 years he has been a member.

Geologist

FRANK R. HUNTER has been appointed geologist for the industrial minerals division of International Minerals and Chemical Corp., Chicago, Ill.

Sales Engineer

JOHN H. DAVIES has been appointed sales engineer of Fort Worth Sand and Gravel Co., Fort Worth, Texas. A native of Fort Worth, Mr. Davies was formerly with the State Highway Department and the Worth Construction Co. He attended Arlington State College, Arlington, Texas, where he majored in engineering, and Texas Christian University, Fort Worth.

Association President

E. J. O'LEARY, vice-president and general sales manager of the Ruberoid Co., New York, N. Y., has been elected president of the Asbestos-Cement Products Association, and John W. Brown, vice-president of the National Gypsum Co., Buffalo, N. Y., has been named vice-president.

Cement Consultant

L. J. BOUCHER, retired plant manager of the Northampton plant of Universal Atlas Cement Co., New York, N. Y., has joined John G. Hoad and Associates, consulting engineers of Ypsilanti, Mich., as consultant on the construction and operation of cement plants.

C. of C. President

DARRELL H. WOOLLEY, safety engineer at the West Des Moines, Iowa, plant of Penn-Dixie Cement Corp., New York, N. Y., has been elected president of the West Des Moines Chamber of Commerce.

OBITUARIES

FRED WITMER, retired president and one of the founders of the Ohio Lime Co., Woodville, Ohio, died September 18 at his summer home at Catawba Island, after an illness of seven months. He was 70 years old and had retired in July of this year. Born in Pillow, Penn., Mr. Witmer started his career in the lime industry with Warner Co. at Philadelphia, Penn., and Wilmington, Del., in the early 1900's. In 1916, together with E. J. Nieman and others, he founded the Ohio Lime Co. and became president in 1926. Mr. Nieman, vice-president of Ohio Lime Co., also retired in July.

Mr. Witmer was active in the National Lime Association, Finishing Lime Association of Ohio, Dead Burned Dolomite Association, Processed Limestone Association of Ohio, American Society for Testing Materials, American Ceramic Society, Glass Container Manufacturers Institute, Contracting Plasterers International Association and the American Bankers Association.

MAJ. GEN. PHILIP B. FLEMING, former Federal Works Administrator and former chairman of the Maritime Commission, died October 6 at the age of 68. Born in Burlington, Iowa, Gen. Fleming was an engineer by profession. He will be remembered by our industries as a frequent guest speaker at conventions. He had numerous friends among producers and many years ago was in the sand and gravel business.

KENNETH CRISS, secretary-treasurer of the Criss Concrete Co., Parkersburg, W. Va., died September 24 in Morgantown after watching the West Virginia-Richmond football game. He was 30 years old. Mr. Criss, a son of Adrian Criss, president of the Criss Concrete Co., was also associated with Criss and Shaver, Inc., Charleston, W. Va.

GEORGE MALFREGEOT, who had been associated with the late H. X. Eschenbrenner in the Universal Concrete Pipe Co., Columbus, Ohio, passed away suddenly on August 27 while attending a horse race at Goshen, N. Y. Mr. Malfregeot had been in the concrete pipe business since 1921. Born in Belgium, he started business in Clarksburg, W. Va., and later moved to Syracuse, N. Y.

GEORGE T. CAMERON, president of Santa Cruz Portland Cement Co., San Francisco, Calif., and editor-publisher of the Chronicle, San Francisco morning newspaper, died suddenly on October 3 as his car arrived at the Chronicle. He was 82 years old and had been president of Santa Cruz Portland Cement Co. since 1908 and head of the Chronicle since 1925.

R. FENTON TAYLOR, traffic manager of the California Portland Cement Co., Los Angeles, Calif., died September 23. He was 65 years of age and had been associated with the company for more than 30 years. A native of Jackson, Tenn., Mr. Taylor had been a resident of Los Angeles since 1908.

JOSEPH M. PHILBRICK, treasurer of the General Builders Supply Corp., New York, N. Y., died September 16 at the age of 85. He had been associated with the firm for 25 years.

JOHN BENSON, retired proprietor of the Benson Concrete Block Co., Duluth, Minn., died August 29 at the age of 89. Born in Sweden, Mr. Benson had lived in Duluth for 68 years and retired in 1945.

CHARLES HARVEY, superintendent of the LaGrange, Mo., plant of the Missouri Gravel Co., Moline, Ill., died August 14. He was 65 years of age and had been superintendent for 30 years.

JAMES H. DALEY, retired manager of the Stoughton Crushed Stone Co., Stoughton, Mass., died suddenly on August 30 at his home in Milford. He was 55 years old and had retired in 1953.

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INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S COVER is an illustration of the Camp Dennison plant of Ohio Gravel Co., in Hamilton County. This is

one of the newer operations of the largest producer of sand and gravel in southern Ohio, and is one of five producing plants and two distributing plants operated by the company. The Camp Dennison plant has an interesting fine sand recovery section similar to the Newtown plant. The company maintains a modern machine shop and laboratory. In addition to sand and gravel, the company also produces agricultural limestone marketed under the trade name, Ogco. Worked out gravel pits have been landscaped and converted into attractive and useful recreation parks. The story about this interesting company appears in this issue.

Lime-Cement Plant Expanding

SOUTHERN CEMENT CO., Birmingham, Ala., is adding another dual purpose rotary kiln at its lime plant, and also storage facilities, raw and finished grinding equipment at its new portland and masonry cement plant at Roberta, Ala. (in Shelby County near Calera). The company plans to install another kiln in 1956. The facilities at Roberta are constructed so that both plants can produce either lime or cement at the same time. The expansion program will boost annual lime productive capacity to 280,000 tons and ultimately increase cement plant capacity by more than 50 percent. Employing about 100 men, Southern does not anticipate additional employment because of the present and proposed expansion programs.

Fly Ash Firm Organized

ATLAS FLY ASH, INC., Buffalo, N. Y., has been organized by a group of Buffalo businessmen to market fly ash in the East. Heading the firm is Frederick W. Reinhold, Anchor Concrete Products Co. Other officers include George E. Weichmann, BAW Construction Co., Inc., vice-president; Wm. L. Schiesel, also of Anchor, treasurer; and Mursett C. Luchner, secretary. The main source of supply will be the Huntley steam station of the Niagara Mohawk Power Corp. The company hopes eventually to sell 900,000 tons annually. Anchor Concrete currently is using fly ash in its production of autoclaved block.

Lime Recovery Plant

BLACK AND ASSOCIATES, an engineering firm of Gainesville, Fla., has presented specifications on equipment for a lime recovery plant at Dayton, Ohio, to city officials. The cost of equipment has been estimated at from $450,000 to $500,000, and includes such items as a rotary kiln and accessories, centrifugal filters, and sludge thickener and agitator mechanisms. The entire project, including plant construction, is expected to cost about $900,000. The plant will be located near the water filtration and softening plant, and will recover lime used in the water softening process, as well as lime already in the water.

"Safest Quarry" Award

MATERIAL SERVICE CORP.'s quarry at Thornton, Ill., near Chicago, was awarded a trophy for being the safest quarry in the country during 1954, in the National Safety Competition conducted by the Bureau of Mines. The quarry had operated 457,570 manhours without a lost time accident. The company was also presented with the highest award the National Safety Council can give, "The Award of Honor," for its safety record during 1954 in all of its activities including ready-mixed concrete trucking operations. In addition, the Greater Chicago Safety Council presented a plaque to Edward Schwartz, superintendent of the Thornton quarry. There were 578 mines and quarries, located in 43 states, entered in the 1954 competition.

Lester Crown (left), vice president of Materials Service Corp., is congratulated by **Edward Quenon** of the U. S. Bureau of Mines at the presentation of a trophy in recognition of the company's Thornton Quarry being the safest in the country

Builds Mica Plant

INTERNATIONAL MINERALS & CHEMICAL CORP. is building a plant at Greenville, Tenn., for the reclamation of mica from silt that has accumulated behind the Davy Crockett Dam in Nolichucky Reservoir near Greenville. The plant, costing about $400,000, is expected to begin operations in the Spring of 1956. It will be operated by the industrial minerals division. Initial capacity is expected to be approximately 100 tons daily. The reserves of raw material were developed by the TVA, and International was the successful bidder on a lease from the TVA for reclamation of the reserve.

Opens Fine Sand Pit

BUILDERS SAND CO., Kansas City, has opened a sand pit and plant on a 200-acre site along the Kaw valley about three miles southeast of Bonner Springs, Kans., at a cost of $200,000. The deposit, containing an abundance of fine-grained sand, is 56-ft. thick, according to exploratory drilling studies. George E. Powell is president, and Russell W. Trent, is superintendent. The company also operates a sand dredging plant on the Kaw River.

Build Sand-Gravel Plant

GEORGE M. BREWSTER AND SONS CO., Bogota, Ohio, is building a sand and gravel plant costing about $800,000, in Gloucester City, Ohio. The plant will dredge sand and gravel from the Delaware River, processing with river water at a capacity of about 200 t.p.h. Plant facilities will include five steel hoppers and a scale house.

Increase Cement Production

LONGHORN PORTLAND CEMENT CO., San Antonio, Texas, has installed a third kiln, a cooler and mill at its cement plant, increasing annual capacity by about one-third, or 700,000 bbl. of cement. Annual output had been approximately 1,800,000 bbl.

Calcium-Chloride Treated Aggregates

B. L. ANDERSON, INC., Cedar Rapids, Iowa, this summer completed a contract for 107,000 tons of calcium chloride treated limestone for surfacing 41 miles of roads in Linn County. The stone was produced at a quarry site near Robins, Iowa, in two portable crushing plants and mixed with calcium chloride and water in special mixing units set up adjacent to the portable plants. Two plants were needed for high production (3500 t.p.d.) and to provide the required stone sizes.

Use of the treated stone produced a high grade, permanent road surface requiring a minimum of maintenance and almost free of dust; these advantages justified the additional 80¢ per ton cost of the treated aggregate.

Build Glass Sand Plant

PACIFIC CLAY PRODUCTS, Los Angeles, Calif., has announced plans to build a glass sand plant, costing about $300,000, near Camanche, Calif. The company has leased 444 acres of land owned by Frank Genochie and Mark Davis, and test drilling has indicated a deposit of about 22,000,000 tons of sand. Two large reservoirs have been constructed, one with a 20-acre ft. storage capacity, and a large basin into which the sand will be flushed. Two wells, approximately 250 ft. deep, will furnish over 200 g.p.m. for the operation. Production is expected to total 125,000 tons of glass sand annually, when the plant is completed. John D. Fredericks is president of the firm.

Expands Cement Production

BRITISH COLUMBIA CEMENT CO., LTD., has announced an expansion program at its Bamberton cement plant, costing about $4,000,000. The program, to be completed over a 2½-yr. period, is expected to increase plant capacity from its present 2,200,000 bbl. annually to 3,200,000 bbl. a year.

Two other cement companies have announced plans to build cement plants in British Columbia. They are International Cement Co. of Britain, and Ideal Cement Co. of Denver, Colo.

Buys Phosphate Plant

INTERNATIONAL MINERALS & CHEMICAL CORP. has purchased the Tennessee Valley Authority's Godwin phosphate plant at Columbia, Tenn. The purchase includes 406 acres, 1.7 miles of railroad siding, and the plant and equipment. After modernization, costing about $750,000, the plant will process approximately 3000 tons of phosphate ore daily from reserves nearby. The plant, built by the government in 1942, will not affect the firm's operations at Mt. Pleasant or Wales, Tenn.

Expands Gypsum Plant

UNITED STATES GYPSUM CO. has announced expansion of its facilities at Plaster City, Calif. The expansion is in addition to the $30,000,000 program for 1955, announced last Spring. The increased production is expected to produce enough gypsum lath and board for 45,000 new homes annually, according to C. H. Shaver, chairman. The expansion is expected to be completed early in 1956.

To Open Silica Deposit

REFRACTORIES DIVISION, Gladding, McBean & Co., has made plans for mining silica rock from a recently-discovered deposit near Lone Pine, Calif. Tests have shown the rock to be suitable for silica refractory brick manufacture. Plans call for storing and shipping the material as needed to the firm's Los Angeles (South Gate) plant.

Gypsum Mining Lease

POWER GYPSUM MINING AND MANUFACTURING CORP. has leased mining rights on a gypsum deposit in the Circle Ridge area of the Wind River Indian Reservation in Wyoming, to mine, process and deveolp gypsum products. L. E. Powers, H. Bode, and Amos Olheiser, all of Riverton, Wyo., are directors of the corporation.

Buying New Tug Boat

WARNER COMPANY, Philadelphia, Penn., is buying a new tug boat for operating its Delaware River sand and gravel barge fleet between Morrisville and Philadelphia. The tug will push rather than pull the barges, thereby giving better maneuverability. This was necessitated because of the heavy traffic of ore boats serving U. S. Steel Company's new Fairless works.

Installs Bulk Cement Plant

SOUTHEAST CONSTRUCTION CO., Auburn, Neb., has started operations at a recently completed bulk cement plant, with a capacity of approximately 718 bbl. Cement is conveyed from railroad cars by a screw conveyor to the storage unit. Cement and aggregates are weighed out in batches to a transit-mixer truck. Orris Sailors is one of the plant owners.

Record Sales, Earnings

PERMANENTE CEMENT CO., Oakland, Calif., reports consolidated net earnings for the six months ended July 31 of $3,310,000 or $1.17 a share; this was a 36 percent increase from earnings during the first half of 1954. Consolidated net sales and operating revenues totaled $23,254,000 compared to $19,014,000 reported for the corresponding period for 1954. Both the cement and gypsum divisions registered new sales records for the first half year.

To Produce White Cement

GENERAL PORTLAND CEMENT CO., Chicago, Ill., is installing complete facilities for the manufacture of both plain and waterproofed white portland cements at its Tampa, Fla., plant, which are scheduled to go into production next spring. General has been producing white portland cements for the last 15 years at its Houston, Texas, plant, under the brand name "Trinity White." The new production will enable the company to serve Florida and the Southeast from the Tampa plant and will release a greater portion of Houston production for distribution to western and Pacific coast markets.

Michigan Gravel Plant

MUSKEGON GRAVEL CO., Muskegon, Mich., has opened a 90 t.p.h. sand and gravel plant in Casnovia Township near Muskegon. The plant produces washed mortar and concrete sand and several sizes of gravel. A gravel jig for removing impurities will be installed. Amos Cottrell is owner and operator and Hartson Erb, Jr., an assistant.

Receives Safety Award

MARQUETTE CEMENT MANUFACTURING CO.'s plant at Cowan, Texas, has been presented an Award of Merit for its safety record of 1,106,805 injury-free man-hours of operation, by the National Safety Council. The plant and quarry operated from February 2, 1951 to July 25, 1955, without an accident.

Potash Plant Being Expanded

SOUTHWEST POTASH CORP., a subsidiary of The American Metal Co., plans to increase the productive capacity of its potash mine and mill at Carlsbad, N. M., by one third. The project will cost $3,500,000 and will be completed by February, 1956.

Expands Cement Plant

THE ASH GROVE LIME AND PORTLAND CEMENT CO. has announced an expansion program, designed to triple the original productive capacity of its cement plant at Louisville, Neb. The program is expected to be completed late in 1956 or early in 1957.

Building Wallboard Plant

PABCO PRODUCTS, INC., is building a $2,500,000 gypsum wallboard plant near Florence, Colo. It is expected to be in operation by April, 1956.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 27,332,000 bbl. of finished cement in July, 1955, as reported by the Bureau of Mines. This was an increase of 7 percent over the July, 1954, figure. Mill shipments totaled 29,124,000 bbl., an increase of 5 percent over the July, 1954, total, while stocks were 5 percent less than those on hand at the same date last year. Clinker production during July, 1955, amounted to 25,945,000 bbl., an increase of 8 percent over the July, 1954, figure. The output of finished cement during July, 1955, came from 157 plants in 37 states and Puerto Rico. During the same period of 1954, 25,482,000 bbl. of finished cement were produced.

Expands Lime Plant

UNITED STATES GYPSUM CO. has announced that production of high purity industrial lime at its New Braunfels, Texas, plant has been increased by more than 60 percent through the installation of additional facilities. A specially-designed rotary kiln was added, as well as a secondary screening and crushing plant and service units. The kiln is equipped with modern instrumentation and automatic controls for precision operation. Requirements for high purity industrial lime are at record-high levels in Texas and other parts of the Southwest, due to the increasing demands of the expanding chemical industries in the area.

Monazite Deposit Found

ONEGO CORP. prospectors have discovered a 4,000,000-ton deposit of monazite sands in the Lost Creek area of the Sangre de Cristo mountains southwest of Las Vegas, Nev. Edward J. James, president of Onego, has evaluated the surface sands at $60,000,000. The surface sands have an average depth of between two and three feet, spread almost uniformly over 332 acres.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of September were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during September, 1955
Roads	2,246,884
Streets and alleys	3,062,179
Airports	488,777
Total	5,797,840

Texas Industries Moves Offices

TEXAS INDUSTRIES, INC. has moved its executive offices and operational headquarters for all its concrete divisions from Dallas to Fort Worth, Texas. The firm and its consolidated subsidiaries reported a sales increase of 34.8 percent for the fiscal year ended May 31, 1955, with profits up 110 percent. Ralph B. Rogers is president of the company.

Survey's Golden Jubilee

THE ILLINOIS STATE GEOLOGICAL SURVEY celebrated its fiftieth anniversary with a program at the Natural Resources Building, Gregory Hall, Illini Union, Urbana-Champaign, Ill.

Announces Dividend

SUPERIOR PORTLAND CEMENT CO., INC., Seattle, Wash., has announced a common stock dividend of 35¢ per share, payable September 10 to stockholders of record August 25.

Acquires Gravel Deposits

OHIO GRAVEL CO., Cincinnati, Ohio, has purchased 123 acres of gravel-rich land on the Great Miami River for $168,000. Fred W. Cornuelle, company president, states that the site contains enough gravel to furnish material for the firm's Cleves, Ohio, plant for the next 30 years.

Opens New Gravel Plant

ACE SAND AND GRAVEL CO., Lake Charles, La., has opened a new 800-cu. yd. per day sand and gravel plant between DeRidder and Merryville. The company will employ 12 men in the plant. E. T. Olsen is president and Phil Olsen, vice-president.

Coming Conventions

November 14-16, 1955—
American Concrete Pipe Association, Fifth Annual Short Course School of Instruction, Chase Hotel, St. Louis, Mo.

November 21-23, 1955—
Southeastern Regional Meeting of National Concrete Masonry Association in conjunction with Texas Concrete Masonry Association, Shamrock Hotel, Houston, Texas.

January 11-14, 1956—
American Road Builders' Association, 54th Annual Convention and Exhibit, Miami Beach Auditorium, Miami Beach, Fla.

January 23-25, 1956—
National Concrete Masonry Association, 36th Annual Convention, Roosevelt Hotel, New Orleans, La.

February 13-16, 1956—
National Sand and Gravel Association, 40th Annual Convention and Biennial Show, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill.

February 13-16, 1956—
National Ready Mixed Concrete Association, 26th Annual Convention and Biennial Show, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill.

February 15-17, 1956—
National Agricultural Limestone Institute, Blackstone Hotel, Chicago, Ill.

February 20-22, 1956—
National Crushed Stone Association, 39th Annual Convention and Exposition, Conrad Hilton Hotel, Chicago, Ill.

Feb. 27-March 2, 1956—
American Society for Testing Materials, Committee Week, Hotel Statler, Buffalo, N. Y.

March 6-10, 1956—
American Concrete Pipe Association, 48th Annual Meeting, The Broadmoor, Colorado Springs, Colo.

April 12-14, 1956—
American Concrete Agricultural Pipe Association, Sixth Annual Convention, Brown Palace Hotel, Denver, Colo.

HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Blending Scales

MANY AGGREGATE PRODUCERS are now producing bituminous paving materials. As many of them are already producers of concrete for paving, their entrance into the production of bituminous paving material augments rather than competes with older operations.

Where gravel is being processed, the trend is to keep crushed gravel separate from uncrushed. In California, washing sand is almost a "must" to meet specifications in the "Sand Equivalent Test." Washing the sand often means that extra equipment must be installed to recover finer sands. Accurate blending of sizes also is important.

Belt type feeder that supplies a regulated flow of material to belt conveyor

One western producer stocks four sizes of crushed stone (¾-in. down to dust) over a reclaiming tunnel with a belt-type feeder below the gate for each size. Each feeder belt motor is driven by a U.S. vari-speed gear motor so that an accurate blend of material goes to the Madsen Iron Works bituminous mix plant. The belt feeders which use 6-in. dia. head and tail pulleys are each 4 ft. long.

Belt Splicing

AT A NEW WESTERN CRUSHED STONE plant, using several miles of conveyor belting (mostly 30-in.), the belt joints were vulcanized on the job using the diamond splice.

In the illustration, the dark area has been chamfered off or peeled so that the plies have progressively exposed feathering at the point. A grinder was used to even up the surface. The opposite end of the belt received similar treatment. The vulcanizing compound was then placed on the cleaned area, the two diamonds were fitted together face to face, and the vulcanizer applied.

Diamond shaped splice makes conveyor belt run smooth

It was felt that by using a diamond splice instead of the more conventional angle splice that the belt would better line up, and hence ride the idlers better. In less than 2 hr. after this belt installation started up, all belts were running true.

Wetting Down Limestone

TO WET DOWN TRUCKLOADS OF DUSTY LIMESTONE, the M. J. Grove Lime Co., Frederick, Md., uses an electronically-operated spray system. Truck drivers leaving the crushed stone plant drive under a steel spraying rack supporting eight water sprinklers. An electric eye at the rack entrance starts the motor of a Deming pump when the truck breaks the path of the electronic beam.

Electronically-operated rinsing racks wet down truckload of agricultural limestone as it leaves plant. Electric eyes control pump motor

With windshield wipers going, the truck continues through the rack, leaving the plant with the limestone wet down and the truck rinsed. Another electric beam at the exit end of the rack stops the pump motor when the truck passes completely through the sprays.

The overhead spraying apparatus was designed by Col. Robert Barrick of M. J. Grove Lime Co., to comply with state laws requiring truck-carried limestone to be wet down during the summer months. Automatic operation of the system saves time and eliminates the inconvenience of having the truck driver leave the vehicle.

Water is supplied to the spray system by a 2 hp. Deming shallow well jet pump located in an 8-ft. pit over a well near the sprayer. Operating at about 30 lb. pressure, the jet pump delivers 15 g.p.m. from the 20-ft. high sprays.

Reclaiming Cement Dust

A MIDWESTERN READY-MIXED CONCRETE FIRM has saved cement through the use of a No. 16 Sly bag-type dust collector mounted on the batching floor. The collector vents (1) the cement compartment of the weigh batcher via a 4-in. galvanized-steel duct, and (2) the concrete discharge cone via a network of 4-, 6-, and 10-in.

Bag-type dust collector mounted on ready mix plant batching floor. Ducts lead from weigh batcher and discharge cone

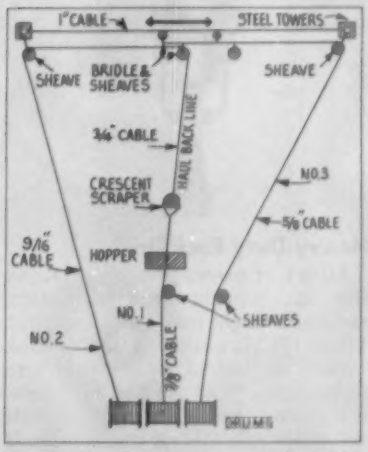
Discharge cone fitted with four ducts for returning cement dust to dust collector

ducts which tap the cone at four sides. The dust is returned to the system by a 10-in. duct discharging to the cement bucket elevator.

The producer estimates that the dust collecting system has paid for itself within five years. Another advantage is that it keeps truck mixers clean.

Movable "Dead-Man" for Power Scraper Installation

IN A SAUERMAN CRESCENT SCRAPER INSTALLATION, the outboard end is the anchor for the pull-back line. Very often, a semi-retired tractor is used as an anchor so that it can be moved from time to time as digging progress-



Details of power scraper installation which has movable anchor operated from the winch station

es. More elaborate anchor installations use 100-ton or more weights on railcars with suitable trackage for movement. Most of these anchors require the operator to manually move it.

However, in the illustration is shown an anchor that permits the operator of the scraper installation to move it without leaving his station. It requires a three-drum hoist; one drum on the pull-in or loadline, one on the pull-back, and the third is connected to a bridle. The sketch shows two steel towers that can be any reasonable distance apart. They are connected by a 1-in. steel cable. The bridle rides this cable and it is not permanently fastened to it. The pull-back line goes through a sheave at the bridle, then over to one of the posts where there is another sheave and back to its drum. The third line is fastened to the bridle and goes through a sheave at the opposite post and back to the third drum. Drum No. 1 has the haul-in line.

When it is desired to move (say, to the right) the out-board end or bridle, the No. 2 line is slackened off and line No. 3 is tightened. When the bridle is in the desired position, the brake on line No. 3 is set (tightened) until it is necessary to move the bridle again. If it is desired to move the bridle to the left, line No. 3 is slackened off and the pull-back line (No. 2) will pull the bridle to the desired position and the brake on line No. 3 is again set. The scraper in the illustration had a capacity of 2½- cu. yd. Cable lines were as follows: No. 1 was ¾-in., No. 2 was ¾-in. and $\frac{9}{16}$-in. at the drum end; and No. 3 was ⅝-in. wire rope.

Roller Chain—V-Belt Drives

AN AGGREGATES PRODUCER on the West Coast uses geared-in-head motors for most of the drives, belt conveyors,

Geared-in-head motor and roller chain drive on belt conveyor

and other equipment, but V-belts also are used, depending on conditions.

Generally speaking, V-belts are used where there is apt to be dusty conditions and roller chains and geared-in-head motors where there is little or no dust. The illustrations shows a U.S. geared-in-head motor operating under relatively dustless conditions, where a belt conveyor is used to deliver a blended aggregate to a Madsen Iron Works asphalt plant.

Screening Out Pea Gravel

A WESTERN SAND AND GRAVEL PRODUCER often had more pea gravel in the finished material than required

Screen in chute removes excess amount of pea gravel

by the specifications. To reduce the amount of minus ⅜-in. gravel, a short length of screen was placed in the chute. The throughs fell to the ground below, and were picked up by a front-end loader and stockpiled. Only a small amount of pea gravel had to be removed.

Steel-lined Wooden Chutes

TO EXTEND CHUTE LIFE, an eastern traprock firm uses wooden chutes (2 in. soft wood boards) lined with ⅜-in. armor plate. The plate is fastened by means of countersunk bolts in the bottom of the chute.

Steel-lined wooden chute connecting 30-in. belt conveyor and 5- x 14-ft. vibrating screen

NEW MACHINERY

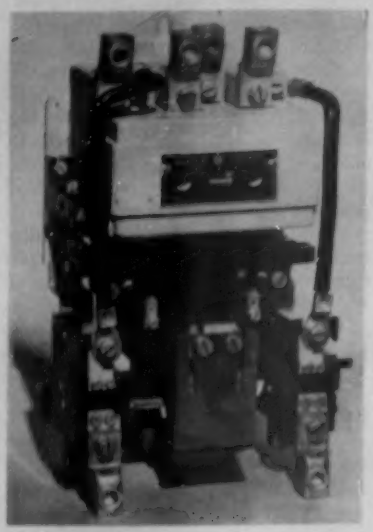
Tractor Wagon

C & D Manufacturing Co., Perkins, Calif., has announced a multi-purpose Movall wagon, Model RD15, for use with Caterpillar DW15 tractors. The wagon has a heaped capacity of 16 cu. yd., and a carrying capacity of 44,000 lb. It incorporates positive cable-controlled ejection, enabling the wagon to handle any material which can be top-loaded. Other features include controlled spreading or dumping action; rugged though comparatively light construction of high tensile steel; a loading target area of 10 x 16 ft.; short turning width of 27 ft.; and dumping time of 11 seconds.

Standard Caterpillar No. 27 cable controls are used with the wagons, permitting a quick changeover from scraper units. Optional equipment includes ejector side-boards for greater capacity with light materials, and a detachable rock guard.

Air-Cooled Package Compressor

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., has added a 125-hp. electric-driven air compressor to its line of air-cooled two-stage Type 40 stationary compressors. Its features include: single-core, horizontal-flow intercooler, new shrouding, force-feed lubrication, full free-air unloading and a new version of the Ingersoll-Rand Channel Valve. Either constant-speed control or dual control can be furnished. The dual control is available with automatic or manual selection, permitting operation at constant-speed or automatic start-and-stop. The Type 40 stationary compressors are also available in sizes of 25, 40, 50, 75, and 100 hp.



Magnetic Starter

General Electric Co., Schnectady 5, N. Y., has announced an N.E.M.A. size 4 vertical lift magnetic starter, 40 percent smaller than previous models of the same size. Designed for motors of up to 100-hp. rating, the starter is the same size and has the same mounting dimensions as the size 3 model. Strongbox coil design includes a cast-on plastic case for maximum protection of coil windings. A permanent air gap causes the starter to drop out when de-energized, regardless of age and usage, and a bi-metallic overload relay provides overload protection comparable to that available in smaller sizes. Suitable for operation of polyphase motors in ratings of 220 volts, 50-hp. and 440/550 volts, 100-hp., the starter is available in reversing, multi-speed, and combination forms, and can be obtained with either vertical or horizontal mechanical interlocks.

Vibrating Mechanism

Deister Machine Co., 1933 E. Wayne St., Fort Wayne 4, Ind., has brought out the Unitized Lifetime vibrating mechanism for smaller size vibrating screens in sizes 3 x 6 ft. to 6 x 14 ft. The mechanism features renewable sleeves between the outer race of the spherical roller bearings and the bearing housings to prevent wear on the housings. Shaft wear is eliminated by renewable sleeves between the shaft and the inner race. The vibrating mechanism itself is dismountable and readily interchangeable as a unit. A large diameter spacer tube maintains proper factory alignments of the entire assembly.

Heavy-Duty Rock Drill

Davey Compressor Co., Kent, Ohio, has brought out a heavy-duty, minimum-weight rock drill, designated Model DS-38, which can be converted without dismantling from blower type to blast type, or to wet type with manual water valve or to wet type with auto-water valve. Three rotation speeds can be furnished; average, fast or slow, and raised center grip and raised tee handles are optional. Pneumatic pawls are used in the rotation ratchet instead of the conventional mechanical pawls. These are "pushed" out of engagement with the ratchet teeth at the time the ratchet starts to turn, thus eliminating rubbing wear on the pawls. Other design features include involute splines, phosphorous bronze air and water tubes, pressure built-in lubricator, chrome-plated cylinder bores and rocket valve with double trip ports for positive piston hammer action.

Magnetic Chute

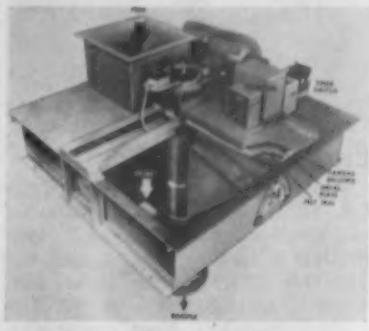
PRATER PULVERIZER CO., Chicago, Ill., has introduced a zig-zag magnetic chute, designed for gravity flow of ground or finely crushed products. Each chute assembly contains two heavy duty permanent magnetic separators and the chutes are constructed so that the material first passes across one magnet, then completely reverses its direction of travel to pass across the second magnet. This construction is adaptable to either inclined or vertical material flows. The chutes are said to remove the fine sliver of metal which normally wear off of processing machinery, as well as occasional nuts or bolts. The magnets are self-contained and are hinged so that the trapped pieces of metal can be cleaned off by swinging the magnet open. The entire assembly is of welded construction and dust tight; it is available in sizes ranging from 8 to 48 in. width. Standard equipment is of carbon steel; however stainless steel is also available.

Spring-Mounted Dump Truck

KENWORTH MOTOR TRUCK CORP., Seattle, Wash., has announced the Kenworth 803, a 40-ton, spring-mounted dump truck. It is designed for off-highway hauling jobs in open pit mining and earthmoving. The dump truck, with a struck capacity of 24 cu. yd., and heaped load of 28 cu. yd., is powered by a single diesel engine, varying between 300 and 500 hp., depending on grades of loaded haul. Turning radius is 36½ ft., with a turning angle of 30 deg. The front axle capacity is 50,000 lb., with an 8-in. I-beam center section. The 100,000-lb. capacity rear axle is designed for wheel bearings of an 8-in. bore, and is a full-floating, double reduction type.

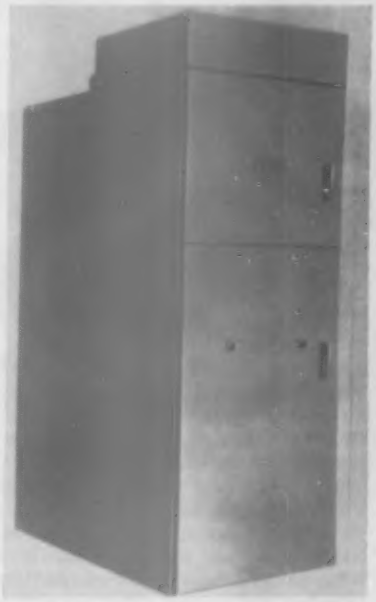
The spring mounting system features four variable rate front springs, and two rear springs. The four front springs, in addition to being rubber mounted at the ends, have steel seats set inside the rubber that shorten their effective length when loaded. When unloaded, the truck rides on rubber.

The power steering system features a full circle steering arm and two hydraulic cylinders. The truck carries 70 gal. of hydraulic oil to operate its steering gear, pumps, hoists and other hydraulic apparatus. The rear brakes feature dual sets of shoes in each drum, operated by four separate air chambers, allowing application of greater brake pressure. The front and rear brake shoes are interchangable. The pump truck also features a torque converter type transmission. The patented three-stage, two-cylinder telescopic hoist is single-acting, straddle-mounted, and fast acting both up and down.



Automatic Dry Sampler

DENVER EQUIPMENT CO., P. O. BOX 5268, Denver 17, Colo., has brought out an automatic Vezin type, dry sampler which features dust-tight operation, with the material in the system passing through encloaed ducts. The sampler features a solenoid-controlled cover over the cutter opening which prevents continuous sampling. A felt pad rests firmly on the cutter blades, sealing them against the entrance of dust. The felt pad is attached to a metal plate which is attached to a canvas bellows. The canvas bellows is secured to the bottom surface of the sampler cover plate. The solenoid is connected by an arm to the bottom metal plate and when the timing mechanism operates, it starts the motor and actuates the solenoid, lifting the sealing unit through electro-magnetic force. The entire unit is sealed with gaskets to prevent passage of dust outside. No part of the electrical circuit, motor or mechanism is exposed to the dust. An enclosed worm gear speed reducer is used. A standard speed, three-phase motor with integral magnetic brake prevents overtravel of the cutter.



High Voltage Starters

WESTINGHOUSE ELECTRIC CORP., P. O. Box 2099, Pittsburgh 30, Penn., has announced a line of high voltage starters with 400 amp. current limiting fuses, air break contactors and sheet steel enclosures. The starters have ratings up to 1500 hp. at 2300 volts and 3000 hp. at 5000 volts for both induction and synchronous motors. The units can be applied on power systems having a maximum fault capacity of 150,000 kv.a. at 2300 volts or 250,000 kv.a. at 5000 volts.

The 400-amp. fuse is a single unit with a single mounting, which limits fault current and interrupts in less than one-half a cycle. Arc boxes are hinge-mounted for access to arcing contacts without removal of other parts. The enclosures are a standard depth of 60 in., and mechanical interlocks between the oil immersed and air break contactors and fuse compartment door are utilized for safety.

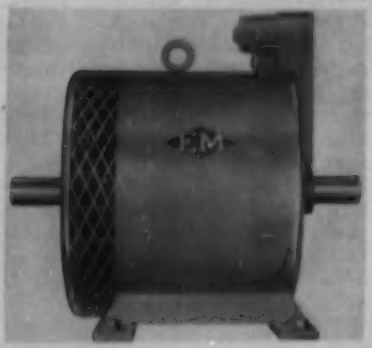
Rail Hopper Car

THE GREENVILLE STEEL CAR CO., Greenville, Penn., has developed a 70-ton covered hopper car of welded design, with a capacity of 2004 cu. ft. No rivets are driven through the con-

taining body of the car, thus eliminating the possibility of their becoming loose and causing leakage. The eight loading hatches, cylindrically designed, 30-in. inside diameter, have one piece pressed dome shaped covers secured with an open type hinge and latching arrangement to guard against retention and build-up of spillage when loading. The cars are equipped with running boards, hand brakes, air brake, etc.

Hydraulic Accumulator

GREER HYDRAULICS, INC., N. Y. International Airport, Jamaica 30, N. Y., has brought out the Greer Accumulator to absorb bucket loader shock and vibration. The hydraulic component is said to permit faster, smoother bucket loader operation, reduce structural strain for longer vehicle life, and lessen operator fatigue. The accumulator connects to the main pressure line with pipe-T and hose between lift cylinders and control valve.



Adjustable Speed Drive

ELECTRIC MACHINERY MANUFACTURING CO., Minneapolis, 13, Minn., has developed the "Ampli-Speed" drive for use as a general purpose drive in a wide field of applications. The unit can be coupled or belted to an existing motor to provide a speed control of plus or minus 2 percent for fans, centrifugal pumps and compressors, and is also designed to handle constant torque loads such as mills, conveyors, machine tools, etc.

The system consists of (1) the "Ampli-Speed" drive installed between the motor, or other drive, and the load, (2) a wall-mounted Magnetic Amplifier Speed Control and (3) a control rheostat mounted at any convenient location. The drive is air-cooled and requires no external cooling system. It consists of a "ring member" connected to the input shaft and driven by the motor, and a "magnet member" which is mounted on the output shaft and turns the load. There is no solid physical connection between the ring and magnet member, though they are connected through two bearings. The Magnetic Amplifier control for the drive adjusts the speed by controlling output of the metallic rectifier supplying field excitation. Speed can be changed by turning the control rheostat knob or by means of automatic control devices such as combustion, pressure or liquid level controls.

The drive is designed for use with motor speeds of 870, 1150, or 1750 r.p.m. Horsepower ratings range up to 95 hp. for fan-type loads; for constant torque loads, the output ranges up to 75 hp., depending on input speed and required speed range.

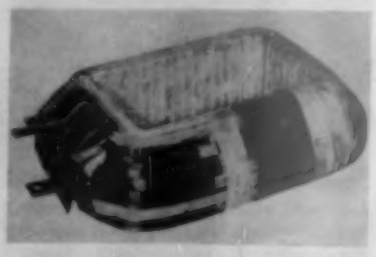
Crawler-Tractor

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis., has announced two diesel-powered units, the 12,400-lb. HD-6 crawler tractor, and the 19,600-lb. HD-6G tractor shovel with a rated capacity of 1½ cu. yd. The features include a diesel engine with follow-through combustion; "wrap-around" radiator guard for greater tractor balance; all-steel, box-type "A" main frame; one-piece line-bored steering clutch and final drive housing; straddle-mounted double reduction final drive gears mounted on tapered roller bearings to reduce gear spreading and corner loading of gears; roller bearing truck wheels with 1000-hour lubrication; Tru-Dimension tracks; and extra long life ceramic master clutch lining.

The HD-344 diesel engine, a four-cylinder, four-cycle unit, develops 45 drawbar hp. with a drawbar pull of 12,650 lb. The HD-6 has five forward speeds ranging from 1.5 m.p.h. in first to 5.5 m.p.h. in fifth gear, and 2 m.p.h. in reverse. The HD-6G has four forward speeds which also range from 1.5 to 5.5 m.p.h., and two reverse speeds at 2 to 4.1 m.p.h. Accessories and interchangeable equipment are also available for both models.

Separation Magnets

THE OHIO ELECTRIC MANUFACTURING CO., 5400 Dunham Road, Maple Heights, Cleveland, Ohio, has announced a line of rectangular electromagnetic separation magnets for removing tramp iron and other undesirable magnetic particles, designated Ohio Super Magnetomotive Magnets. Specially designed for suspension over the head pulley or in a horizontal position over a conveyor belt, the magnets are suspended by means of adjustable length cables. Insulating materials used in the magnet were selected to withstand high temperatures encountered under continuous operation. High dielectric strength is said to result in maximum electrical resistance to ground under all operating conditions. The magnets are available in several models, ranging from Model SM20, with an effective range of 6 in. at a belt speed of approximately 200 f.p.m., up to the largest Model SM60, with an effective range of 19 in. at a belt speed of about 500 f.p.m.



Improved Motor Insulation

GENERAL ELECTRIC CO., Schenectady 5, N. Y., has announced the use of Class H insulation on the MD-600 line of d-c armored motors. The above illustration of a compound field coil shows the various stages of insulation.

Layers of mica (A) insulate leads and terminals from the coil body; ties of fiberglass tape (B) pretreated with silicone varnish hold portions of coil in place during and after winding; the outer wrapping (C) of glass tape is applied after impregnation; and mica tape (D) is used to increase dielectric strength and resistance to heat.

Previously this insulation was available on special order only. It has been adapted to the field coils, armature coils and the main area of the armature insulation, the three sections most susceptible to high heat concentration damage. The Class H insulated coils may be interchanged with Class B coils in older models of the line.

Automotive Rail Car Mover

WHITING CORP., Harvey, Ill., demonstrated its new heavy-duty Model 3-TM Trackmobile before a group of industrialists and editors in Chicago, Ill., on October 4. Used to haul, switch, and spot railroad cars, and as an industrial truck, the new machine is a more rugged successor of the original Trackmobile model developed by the company four years ago. The machine operates on both road and track; only 90 sec. is required to convert from rubber-tired wheels to rail wheels.

The new Trackmobile has a drawbar pull of 12,800 lb., compared to 8400 lb. for the original model. This relatively high power for a machine weighing approximately 9000 lb. is made possible by the Trackmobile's patented hydraulic jacking coupler which raises the freight car's coupler, thereby transferring up to 20 tons of the car's weight onto its wheels. Operating in low gear during the demonstration (there are four speeds forward and one reverse), the machine moved six loaded coal cars having a combined weight of 1,000,000 lb. Rail grades up to 3 percent can be negotiated under full load. For greater grades, air brakes are required in place of standard 12-in. dia. hydraulic and mechanical brakes.

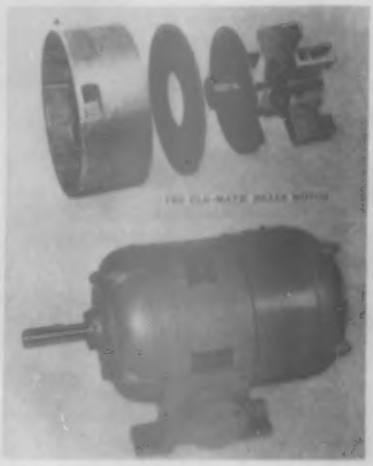
The machine has a heavy duty all-welded frame, a tractor-type retractable suspension to protect against shock when crossing ungraded track, a truck-type four-speed transmission and axle, and electrically-operated sanders. It is driven by a 100-hp. V8 gasoline industrial engine. All controls, including those for positioning, raising and lowering the automotive-type wheels, and coupling and uncoupling rail cars, are located in an elevated, glass-enclosed cab. On road wheels, the machine has a maximum drawbar pull of 3500 lb., and can be used as an industrial truck for towing portable equipment.

Wire Reinforced Tires

UNITED STATES RUBBER CO., New York, N. Y., has announced a line of truck tires containing from one to eight miles of flexible, high strength steel wire. The wire is said to make a tire tread rupture-proof, double cut resistance and eliminate tread cut growth. It is also said to make a tire run from 20 to 40 deg. cooler, reduce the danger of centrifugal force throwing off treads at high speed, improve high speed riding qualities, and contribute to increased tread mileage. Wire is available in the Fleetway and Super-Fleetway truck tires in sizes ranging from 600 x 16 to 1100 x 20.

Dust Collector

NATIONAL DUST COLLECTOR CORP., Chicago, Ill., has brought out the Hydro-Filter wet-type dust collector which operates on the filtration principle. The unit is basically an "air scrubber" as dust is brought into contact with water under such conditions as to cause the dust to transfer to the liquid stream by impingement on wetted glass spheres or entrapment within bubbles, water droplets or mist. An automatic air-water balance is sustained within the unit to compensate for variations in volume and velocity of air flow and to provide near uniform separating action within the filter bed of glass spheres.

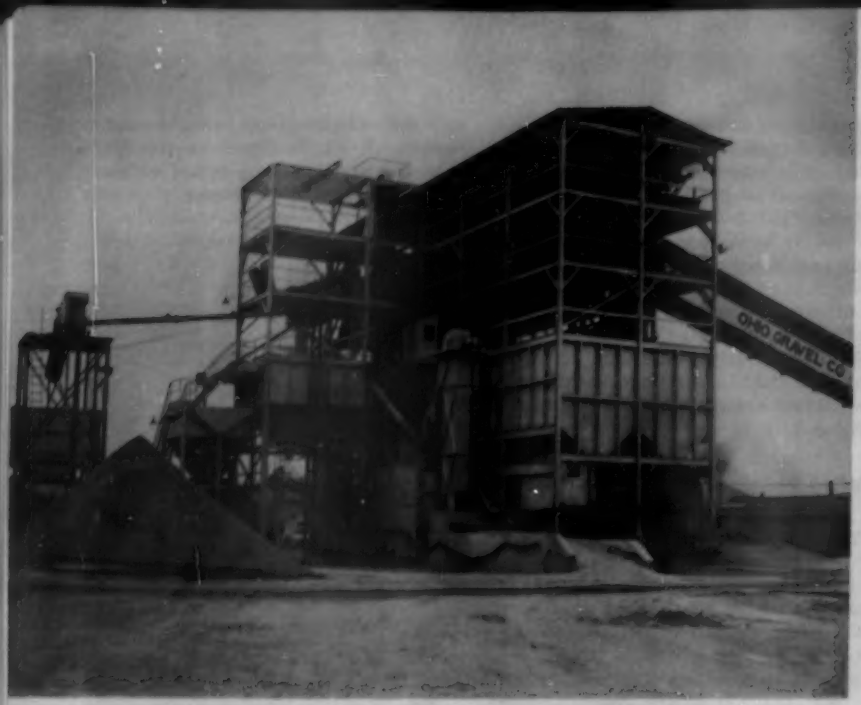


Mechanical Motor Brake

THE CLEVELAND ELECTRIC CO., 5213 Chester Ave., Cleveland, Ohio, has announced a mechanical motor brake built into the motor frame and enclosed in the housing. It allows quick opening and avoids sudden impact on stopping. Tension springs can be adjusted for rapid or slower stops, and four locking screws give the desired adjustment. The motor can be installed in any position and is especially designed for work requiring frequent braking. The brake assembly has fans for temperature control.

Gasoline Hammer Rock Drill

SYNTRON CO., 450 Lexington Ave., Homer City, Penn., has added an improved self-contained gasoline hammer rock drill to its line of power tool equipment. Designated Model RD-55, it can drill to a depth of 13 ft. at a rate of approximately 2 f. p. m. when using Syntron hollow drill steels with carbide tips. Air, compressed by the reciprocating hammer or striking piston, blows the dust and cuttings out of the hole, in addition to providing automatic rotation of the drill steels. Three sets of hollow carbide drill steels are available for the unit. Short sets use 2-, 4- and 6-ft. steels with $1\frac{3}{8}$- to $1\frac{7}{8}$-in. dia. bits. The long sets use 8-, 10- and 13-ft. steels with $1\frac{3}{16}$- to $1\frac{1}{4}$-in. dia. bits.



Cleves plant looking west, showing re-crushing arrangement built onto main plant. Enclosed elevator feeds a 48-in. impact crusher; open elevator carries material to screening section

By HUBERT C. PERSONS

Strategic Location of Gravel Plants

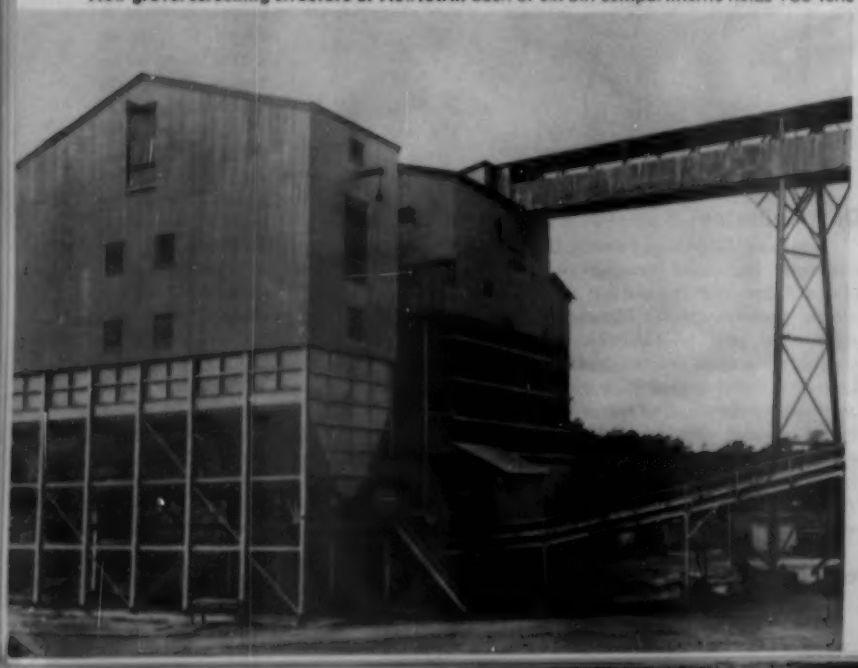
FRED W. CORNEULLE, president and general manager of Ohio Gravel Co., Cincinnati, largest gravel producer in Southern Ohio, is one of the few men able to indulge a hobby while making an outstanding business success. Before the first World War, Mr. Corneulle ran a relatively small sand and gravel plant with horse-drawn equipment. Now Ohio Gravel operates five producing plants with the most modern equipment available. The company also has two distributing plants.

Mr. Corneulle's hobby is reclaiming worked-out gravel pits, landscaping and beautifying the sites and converting them into attractive and useful recreation parks. This hobby, although a personal activity financed by Mr. Corneulle, makes friends for the entire gravel industry and in the long run is likely to even return a profit.

In 1931, soon after the Ohio Gravel Co. was incorporated, Mr. Corneulle realized the advantage of strategic location of plants for the greater convenience of customers. His theory, proved sound by experience, is that a number of relatively small plants around the perimeter of the city and located on railroads or good highways, would be a decided asset and would insure fast customer service.

Putting this theory into practice, Mr. Corneulle located one plant on the Norfolk & Western Railroad at Newtown, Ohio; one at Miami Station on the Chesapeake & Ohio; one on the New York Central at Cleves, Ohio, and two on the Pennsylvania Railroad, one of these being at Miamiville in Clermont County, and the other at Camp Dennison in Hamilton County. One of the distributing plants in Bond Hill, a northeastern suburb of Cincinnati, handles material shipped from the Newtown plant. A 24-in. belt conveyor at the Bond Hill loading out bins connects with the plant of the Richter Concrete Corp. The other distribution plant is in Covington, Ky., across the Ohio river from Cincinnati. This is operated under lease to the Ready Mixed Concrete Corp. of Covington.

New gravel screening structure at Newtown. Each of six bin compartments holds 180 tons

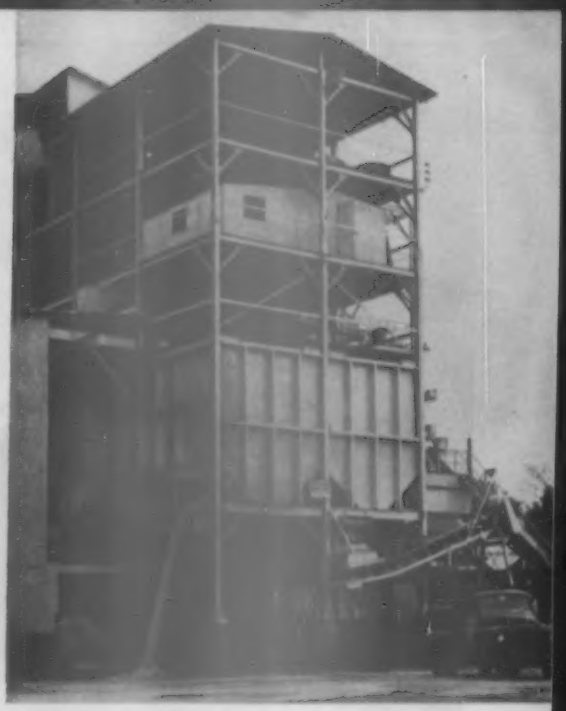


One hundred dump trucks, most of which are Mack six-wheel units, haul from shovels or draglines to the primary hoppers in all the plants. It has been found that by having truck service to the hoppers, materials can be fed to the plant most advantageously. Deliveries to customers are handled by 150 to 200 trucks operated by contract haulers.

All deposits are worked by at least two pieces of loading equipment. This means that the correct blend of the material wanted on any particular day

READ ABOUT

. . . how the Ohio Gravel Co., operating five producing plants in the Cincinnati area, has reclaimed worked-out gravel pits, converting them to recreation parks. Use liquid cyclones to recover fine sands at two of the plants, and produce agricultural limestone by reducing limestone gravels.



Cleves plant showing method of loading cars where all gravel is rewashed over a 3- x 6-ft. low-head screen before going into railroad cars

Pays Off In Service and Economy

can always be fed to the plant to obtain the greatest production without unnecessary stockpiling. If the predominant demand of the day is for sand, one shovel is worked in a sand bank. If gravel or crushed boulders are wanted, the shovel is operated at another spot. Walter J. Flach, vice-president in charge of production, points out how this system works at the Newtown plant which has a capacity of 400 t.p.h. This rate of production could not be obtained, Mr. Flach believes, if only one type of material were being fed to the plant.

Two power shovels are used in the Newtown pit, one is a 2-cu. yd. Model 820 Lorain, the other a 2½-cu. yd. Northwest. Excavated material is carried in Mack dump trucks to a field hopper from which a 24-in. belt conveyor, 632 ft. centers, moves it to a hopper at the main plant. Here it passes to another 24-in. belt conveyor, 480 ft. centers, with a rise of 75 ft. to the scalping screens.

The Newtown plant and all other Ohio Gravel Co. operations are dual operation plants, washing and sizing all material under 1¾-in. for concrete aggregate and diverting all material over 1¾-in. to the crushing plant. Boulders or all material over 3-in. dia. go to a 2-ft. 4-in. Traylor reduction crusher. Smaller material is fed to two 36-in. Telsmith Gyrasphere crushers and a 6-in. McCully.

A completely new screening building, erected at the Newtown plant during 1954, contains six bunker-type bins, each with a capacity of 180 tons. a bucket elevator feeds two 4- x 12-ft. 3½-deck Allis-Chalmers lowhead screens where material meeting various specifications can be produced simultaneously.

All of the water discharged from the classifiers and washers together with ground water is piped to a 10- x 16-ft. sump, 10-ft. deep, from which it is picked up by a 6-in. Nagle pump and carried to a 24-in. DorrClone sand separator mounted above a settling tank. This removes all the solids and permits the remaining silt and water to be discharged to a worked-out section of the pit. An average of 16 tons of fine sand per day is recovered by this means at the Newtown plant. This recovered fine sand has a sieve analysis as follows:

Sieve	Percent Passing
4	100.0
8	98.7
16	93.4
30	80.6

Shovel loading trucks in pit at Camp Dennison plant. Modern crushing and processing plant shown in the background

Close-up of Camp Dennison plant with interesting arrangement of covered conveyors

50	59.2
100	43.7
200	24.6

This sand is suitable for blending purposes where there is a deficiency of fines in concrete sand.

This interesting sand recovery set-up at the Newtown plant was designed to meet a problem which was created in discharging water from the plant together with ground water to a worked out portion of the pit. In a period of from 10 to 12 years, this pit had been completely filled, necessitating its removal. When this job was completed and the cost computed, it was found that $60,000 had been spent in truck and shovel time on this operation. In analyzing material removed from the pit, it was found to contain about 80 percent fine sand or material, practically all of which was retained on a 270 mesh screen. This situation prompted the company to install the sump pump and the DorrClone to recover the fine sand.

The DorrClone was located over a settling bin already in use at the plant just as a method of catching the discharge. At the time it was installed, it was known that it was not where it eventually would be located, but the company was experimenting. The experiment has been so successful that it is now planned to move the DorrClone up into the gravel washing plant and install it over the sand classifiers so the discharge can be properly blended into the concrete sand to bring up the percentage of fines passing a 50 and 100 mesh screen. As this fine material cannot be blended in a stockpile without a mixing operation, the company is very much satisfied with the manner in which both the DorrClone and Nagle pump has operated. A similar successful operation has been obtained at the Camp Dennison plant with the Wilfley pump and Cottrell cones.

The Newtown plant stockpiles 4000 cu. yd. of sand, graded gravel and crushed stone. A special material plant is also operated to fill orders for sizes named in unusual specifications. A Cedarapids impact crusher with a capacity of 250 t.p.h. is used to produce special materials.

An agricultural limestone marketed under the trade name Ogco is also made in the Newtown plant. As the larger particles of the gravel are limestone, this product meets Federal specifications for agricultural limestone.

The Cleves plant, with a capacity of 350 t.p.h. of sand and gravel, is located on the western edge of Cincinnati. It was entirely rebuilt in 1936 after a fire destroyed the existing plant which had been devoted especially to the manufacture of railroad ballast. The plant now produces highway materials and building sand and gravel to meet all specifications.

A Model 41 Lorain dragline with a 1-cu. yd. bucket and a 2-cu. yd. Model 820 Lorain shovel are used in the Cleves operation. Other equipment at the Cleves plant includes: a 48-in. Stedman crusher; a 24-in. x 36-in. Allis-Chalmers jaw crusher; a 3-ft. Symons cone reduction crusher; and a 36-in. Telsmith Gyrasphere crusher.

One unusual installation at the Cleves plant is due to the stream pollution law in Ohio, making it mandatory for industrial plants to clarify all waste water before it is discharged into the river. A system has been set up at Cleves by which all waste water goes to a sump from which it is taken by a Wilfley sand pump and sent to a worked-out area of the pit. Present plans do not contemplate reclaiming the wasted sand. Material taken from the pit is conveyed to the plant entirely by truck, a 3.3 mile highway haul.

The Miami plant is located northwest of Cincinnati close to the Big Miami river. Plant capacity is 300 t.p.h. Material comes from two sources, one being a 60-acre gravel bar in the river, formed over many years of accretion. The other source is a pit, requiring a three-mile highway haul to the plant.

A Model 80-D Northwest dragline with a 70-ft. boom and a 3½-cu. yd. Hendricks bucket is used at the gravel bar deposit. Two 1¼-cu. yd. Model 75 shovels are used in the pit. The

A County Fair exhibit showing model sand and gravel plant and concrete mixing plant along with agricultural limestone display

Two veteran shovels and cranes operated by the company. The one to the left was the first modern crane received in 1926. Claude Shelton shown in the cab has operated this machine continuously since that time. The crane to the right was the first power unit owned by president Fred W. Cornuelle. This machine was received in 1923

pit deposit is exceptionally coarse, necessitating the use of a 24-in. x 36-in. Traylor primary jaw crusher. A 21-in. Traylor is used as a secondary crusher and a 48-in. Telsmith Gyrasphere for fine reduction. All screens at the Miami plant are Allis-Chalmers.

Here as at the Cleves plant, the Ohio stream pollution law is being observed by the use of special equipment. Waste water is sent to a sump, from which it is piped by a Nagle pump to a Dorr-Clone sand separator and discharged into a clarifying pond.

The Miamiville plant, located northeast of Cincinnati in Clermont county, has a capacity of 400 t.p.h. There is a 2½ to 3-mile truck haul from the pit to the plant. Material in the pit is loaded by a 3½-cu. yd. Model 80-D Northwest dragline and a 2-cu. yd. Lorain 820 also loads into trucks for delivery to the plant.

This is one of Ohio Gravel's oldest plants and the only one served by a skip hoist, originally installed to handle wet material being excavated below water. Because most of the feed going to this plant is of relatively small size, no primary crusher is required. However, a 16-in. McCully is used, and a 4-ft. Symons shorthead cone is available for fine reduction. All screens are Allis-Chalmers.

The plant at Camp Dennison, on the Pennsylvania Railroad east of Cincinnati, is one of the newer operations. Tunnel conveyors are used under stockpiles. A Model 52-B Bucyrus-Erie shovel and a 2-cu. yd. Lorain Model 820 are used in the pit. A 24 x 36-in. Telsmith jaw crusher does the primary crushing with a Model 13-B Telsmith gyratory as a secondary, and a Symons 3-ft. shorthead cone and a 48-in. Telsmith fine reduction crusher for fine reduction. Screens are Telsmith and Allis-Chalmers.

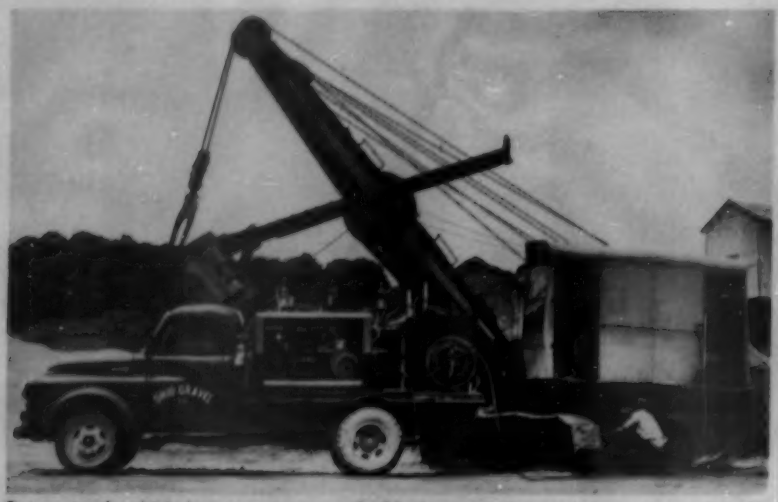
All wash water at the Camp Dennison plant is picked up by a Wilfley sand pump and sent to two Cottrell sand cones where the fine materials are separated from the water and slime.

Machine Shop-Laboratory

A modern machine shop located on by-pass Route 50 near the Miamiville plant is an important adjunct of the Ohio Gravel Co. operations. The main machine shop building is 60 x 120-ft. The auxiliary building is 50 ft. square and the machine shop storage building, 30 x 60 ft. The shop handles repairs on all heavy equipment and has facilities for building special equipment not readily available elsewhere.

In order to be certain that its products meet all specifications, Ohio Gravel maintains an Engineering Material Testing Department adjoining the general office. This department operates a laboratory equipped to make sieve analyses and all A.S.T.M. tests. Testing and inspection work are handled by R. C. Aldrich, consulting engineer, Art Ward, materials engineer

A 24-in. liquid cyclone mounted above a hindered settling tank



Grease truck which has proven very valuable in preventive maintenance, serving the four plants on the east side of Cincinnati. A two-man crew lubricate everything below the cab and also fill fuel oil and gasoline tank

Showing part of laboratory with engineering and inspection personnel. Left to right: Art Ward, materials engineer; R. C. Aldrich, consulting engineer; and Ralph Bee, materials inspector

Another section of laboratory showing testing sieves and other equipment

and Ralph Bee, materials inspector. Two pick-up trucks are run by the department to facilitate inspection and testing service and assist customers.

A traveling grease truck which serves the four plants in the eastern area of Cincinnati is an important piece of equipment. This truck and its two-man crew move constantly from plant to plant, lubricating machine or truck parts and supplying gasoline or fuel oil where needed. Company officials say this equipment has proved to be extremely valuable as a preventive maintenance measure.

Two examples of the value of the repair shop and its preventive maintenance program are pointed to with pride by Mr. Corneulle. One is a 32-year-old Erie steam shovel which is now being used as a crane. Bryan Werner, superintendent at the Bond Hill plant unloaded and operated this machine until it was retired from active service; it now is being used to erect steel and handle various pieces of equipment when necessary. The other example is a Northwest 105 electric crane purchased by Mr. Corneulle for his Red Bank Gravel Co. plant in 1923. The Northwest Model 105 crane was reconditioned in the company shop five years ago after 24 years of service. It is still being run at the Miamiville plant by Claude Shelton who has operated it continuously since 1926.

But machines are not the only veterans in the service of the Ohio Gravel Co. President Corneulle and two members of the board of directors are three of the oldest gravel men in the Middle West in point of service. Besides Mr. Corneulle, who is a former president of the Ohio Sand & Gravel Producer's Association, they are William H. Barber and George W. Doran. Their combined experience in the gravel business is estimated to total more than 200 years.

Key personnel not previously mentioned in the Ohio Gravel operations include: George Nash, Newtown plant superintendent; Ralph Hautman in charge of the Miami Station plant; William O'Shaughnessy, who runs the Cleves plant; Andy Capazio at Miamiville and Harry Ward, plant superintendent at Camp Dennison. George Sellars is superintendent of the machine shop. Dispatcher is Joe Wolf.

Evidence of President Corneulle's hobby of reclaiming and beautifying worked-out gravel pits, may be seen in two places east of Cincinnati. One is known as Lake Isabelle, a fishing lake and recreation park on the Loveland-Madeira road. The other is Lake Bern on by-pass Route 50 near Miamiville on which Mr. Corneulle has built a cottage and provided recreation

facilities for his family and friends. Both of these lakes were abandoned gravel pits purchased from the company by Mr. Corneulle. Grading, seeding and planting of trees, shrubs and flowering plants have transformed them into beauty spots.

Advertising Program

For years Ohio Gravel has carried on a consistent program of advertising in newspapers and farm journals on sand and gravel and on "Ogco agricultural meal." The newspaper advertising is notably public spirited and institutional in character. Good sized newspaper space is used in support of such causes as traffic safety, better highways, Boy Scouts, and various civic improvements. From time to time substantial newspaper space has been used to call attention to large projects such as a new hospital, new high school, public library, new health center or an expressway in which Ohio Gravel aggregates were used for the concrete.

One unusual series of newspaper advertisements which attracted wide attention was headed: "The Romance of Gravel." The copy explained the many uses of sand and gravel, the importance of concrete for construction purposes and the care taken to be sure that aggregates meet rigid specifications.

The advertising on Ogco agricultural meal is personalized for the most part, telling the experiences of individual farmers and livestock men in soil conservation programs. This series of advertisements has drawn much favorable comment and was the subject of an editorial in the old and conservative Cincinnati Enquirer, which had no ax to grind since the Ogco advertisements appear only in rural papers. The Enquirer editorial said in part:

"The Enquirer, interested always in conservation activities, has been studying details of an advertising campaign carried on by the Ohio Gravel Co., a firm which among other things supplies lime for agricultural lands. We do not participate in this campaign in any way, since it is limited strictly to rural newspapers, but we can see that its effect on local soils will be great—and good. We can see too, that the investing company is selling a conservation idea rather than a product. In many advertisements the company name has not appeared at all.

"Above all, the advertising series tells a remarkable story of land building. Individual farmers in Clermont and Hamilton Counties had told how the addition of lime has brought life and production to fields which only a few years ago were semi-sterile. They have shown how their pasture and cover crops have benefited; how fertility has been increased; how erosion has been retarded or stopped completely. Their experience being passed on to others, will result in even larger future gains.

"The advertisements in question are an important contribution toward the general effort to save and improve the nation's greatest natural resources —the soil from which our foodstuffs come. They offer another example of how individual enterprise, pursuing an unselfish course, works in the interest of all."

Inside view of well-equipped machine shop showing shaper, slotter, mill and lathe

View of Miami plant looking south

Colorful Brochure

NEW JERSEY SILICA SAND CO., Millville, N. J., celebrating its 35th anniversary, published a unique, colorful four-page brochure describing its production of moisture-controlled natural bonded molding sands. Developed along the idea that "one picture is worth ten thousand words," the booklet features four outstanding 6½- x 9-in. colored photographs showing the well-ordered pit, plant, and laboratory operations, with a concise description imprinted on the back of each illustration. The brochure also includes laboratory analyses of 15 grades of bonded sands, which have a controlled moisture content of 4 to 7 percent. Clarence R. Wolfe, co-founder of the company, is president and general manager; he is also president of the National Industrial Sand Association.

Canada Cement Bond Issue

A NEW ISSUE of $20 million Canada Cement Co. Ltd. 3¾ percent debentures, 1955 series, is being offered by Wood, Gundy and Co. Ltd., Toronto, Ont. The issue, dated September 15, 1955, includes $6 million serial debentures, due between 1958 and 1965 and $14,000,000 sinking fund debentures, due 1975.

Proceeds of the new issue will be added to the company's general funds to be used for general corporate purposes. The plant under consideration at Beachville, Ont., will cost an estimated $12 million and a new clinker grinding and shipping plant at Edmonton will cost $2,750,000.

Three flights of belt conveyors deliver stone to the cement plant with a surge pile at the end of each flight

Long Conveyor from Quarry to Cement

• Oregon Portland Cement Co., Lime, Ore., operates three long conveyor flights, with surge piles at transfer points, to move stone from quarry at higher elevation to cement plant in valley

A NEW QUARRY has been opened by Oregon Portland Cement Co. at its Lime, Ore., plant near the Idaho border, in which long belt conveyor flights, with surge piles at transfer points, are used in contrast to the abandoned aerial tramway system which served the old quarry.

The new Lime, Ore., quarry supplies a high grade, high calcium limestone for the Oswego plant near Portland, as well as the eastern Oregon operation. It is directly across the canyon from the discontinued quarry, and is on the same side of the mountain as the cement plant. It is located well up the side of the range. The primary crushing plant is at the quarry. The difference in elevation between the working floor of the quarry and the floor at the plant is 735 ft.

Long Conveyor Flights

Three flights of conveyors deliver to the plant with a surge pile at the end of each flight. The belt sections have a total length of a little over a mile, center to center. Sections No. 2 and 3 are both about 2200 ft. long, center to center. The use of surge piles at transfer points as well as a storage pile at the end of the transportation system is a novel departure from more standard surge pile practices. It not only affords plenty of stone for the plants, but makes it possible for the quarry to run a week or more even if stone is not used or shipped. It eliminates troubles at the transfer points such as a plug-up. Stone may also be shifted from pile to pile for blending purposes, if desired. The failure of Sections No. 2 or 3 means that No. 1 can still keep the quarry operating. The storage piles have a capacity of 75,000 tons. The plan and elevation of the belt conveyor installation is shown in one of the illustrations.

Before designing the long belt system, Carl N. Anderson, consulting engineer, and H. R. Shipley, assistant general superintendent of Oregon Portland Cement Co. made an extensive trip through the East and South to see first hand some of the installations in use.

Belt conveyor No. 1 receives the crushed minus 5-in. limestone from the primary 36- x 48-in. Lippmann Engineering Works jaw crusher. The crusher is mounted on heavy steel "I"-beams that rest on heavy concrete foundations. This design was selected as it permitted more room on both sides of the off-bearing conveyor belt. It is also easier to inspect, and to keep the area clean under the crusher.

The first belt is 36-in. wide and handles 650 to 700 t.p.h. The remainder of the belts are 30-in. and carry 450 t.p.h. Two Euclid, 18-ton payload, rear-dump trucks deliver rock from the quarry working level to a Pioneer apron feeder ahead of the jaw crusher. A 5-in. heavy rail grizzly is located between the apron feeder and the crusher with throughs falling to belt No. 1 that delivers to storage pile No. 1. The haul from quarry face to feeder is about 750 ft. over a flat grade. Wood supports are used for the conveying

Cement plant at Lime, Ore., served by new quarry with long belt conveyor flights moving stone from primary crusher

Plant Generates Current

By WALTER B. LENHART

system as it twists over the mountainous terrain to the plant. The belt is covered with corrugated metal, having one side left open for easy inspection. Under each storage pile is a heavy duty Jeffrey-Traylor electric vibrating feeder. The feeders are Type 5H, 60-cycle, 440-volt units. The reclaiming tunnels, of corrugated metal, are 10-ft. dia.

To those who have had drive troubles when a long, steeply inclined and loaded belt fails to stop during an emergency, the drive assembly for the two longer flights and the system of braking are of especial interest. The drives used on the two long belt sections are patterned somewhat after the system used at Bull Shoals Dam. This long belt installation was described in ROCK PRODUCTS, September, 1951, page 78. The drives on the two long conveyor flights were selected on account of their simplicity. Each consists of two General Electric 100-hp., 900 r.p.m., 2300-volt motors hooked up as follows: Motor A is used for starting only and is connected to the shaft of Motor B through a V-belt drive. This drive has a 2 to 1 ratio, so the conveyor starts at half speed. By means of a time delay relay, the current is then cut off Motor A and applied to Motor B which brings the belt up to full speed. Speed reduction is attained through a Falk reducer and final chain drive. As both of the long flights develop power, Motor B acts as a regenerative brake and sends current back into the line. The starting Motor A could be much smaller, but it was decided to make it the same size as B so that it could be used as a spare should the latter break down. A Thrustor operated brake stops Motor B in event of a power failure. In addition to the solenoid, there is a second brake. On the drive assembly and adjacent to the head pulley itself, a brake wheel of generous proportions is tied in with the drive.

This large band brake on the drive pulley shaft stops the belt in event of any mechanical failure; such as, breaking of shafts, coupling or final drive chain. It was built by Link Belt from specifications supplied by Oregon Portland Cement Co. It consists of a post type brake having a drum with a 42-in. dia. and 7-in. face mounted on the 7-in. dia. drive pulley shaft. It is held open by an electric Thrustor that is operated by a centrifugal governor limit switch which is driven from the drive pulley shaft. Should the belt speed increase by 5 percent, the current to the Thrustor is cut off and the brake is set by a spring and lever system. The tension on the spring is set so as to decelerate the loaded belt at the rate of one foot per second per second. This brake also operates in event of a power failure. Conveyors No. 2 and 3 are both equipped with this type brake. The dual brake assembly has not had an opportunity to function under emergency (and working) conditions, but on trial runs at the outset of operations, it was said the brakes worked perfectly. No. 1 belt that receives the crushed stone is a Goodrich. All the other belts are Goodyear. All ride Robins conveyor idlers.

At the plant, the minus 5-in. stone is screened over a 4- x 10-ft. Tyler screen. It is a two-deck unit but only one deck is used. The screen carries 2¼ to 2½ in. wire with the plus fraction moved by belt conveyor to a storage pile near the car loading apron. This stone is all shipped in open hopper cars to the Oswego plant near Portland, Ore. The haul is about 380 miles over the Union Pacific railroad. The minus stone is used in the cement plant at Lime, Ore. The screen cloth is changed as required to maintain a balance between the Oswego plant and local needs.

At the two lower storage piles between plant and crusher, water sprays

A 3½-cu. yd. electric shovel loads two 18-ton rear-dump trucks that deliver stone from the quarry working level to the primary jaw crusher

have been installed so that the water impinges into the stone as it falls to the pile below. By the use of the sprays, dust at the piles is practically nil.

Quarry Operation

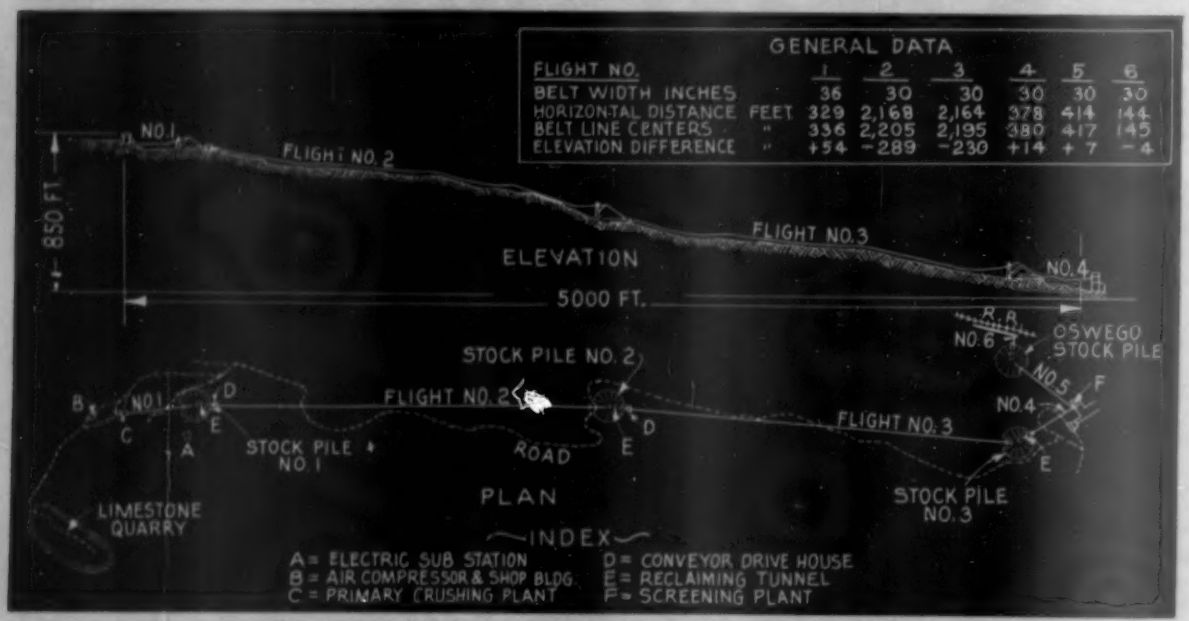
The quarry is still in the early operational stages with three levels being opened up with possibly later a fourth level. The total height of the faces is in the 350-ft. range. A Joy rotary does the primary drilling with a 4½-in. bit. Primary loading is done with a 3½-cu. yd. P & H electric shovel. The stone is a gray color, shatters reasonably well, and there is an adequate supply of stone for many years' operation.

Compressed air for the quarry is supplied by a new Ingersoll-Rand Type XLE, 19½ x 11½ x 8½ compressor driven by a 200-hp. General Electric synchronous motor. The compressor is located near the primary crusher building and cooling water must be hauled to the compressor by truck.

To reduce the cooling water requirements, the compressor water circulates through a large cooler that operates similar to (and resembles) a large automobile radiator. This radiator is about 8- x 10-ft. in surface area, and behind it is a large fan. Hot water from the compressor passes through the cooler and back to the compressor with thermostatic controls in the line so that if the compressor gets too hot, the assembly will stop. The cooling system was supplied by the Young Radiator Co., and is referred to as an engine jacket water cooler, Model 231. Its use cuts the water requirements to a low figure.

The Lime, Ore., cement plant was built in 1923. It has a Vulcan rotary kiln, 9- and 10-ft. dia. by 210 ft. long. Production of lime at this plant was discontinued several years ago.

The new installation at the quarry and the conveyor system was designed under the direction of Carl N. Anderson, consulting mining engineer, Portland, Ore. Mr. Anderson has had a wide and varied experience in the Northwest, both in the metal mining industry and in portland cement. Laughlin McLean is superintendent at Lime, and has been with the company since 1923. F. E. McCaslin is president of the Oregon Portland Cement Co. and D. H. Leche, is vice-president and general superintendent. General offices of the company are located in Portland, Ore.



Elevation and plan of conveying and stockpile system serving cement plant

Exterior of Leslie plant with grinding building and office in foreground

Complete New Silica Refractory Plant

• Leslie, Md. plant of Harbison-Walker is its third silica brick works. Brick are dried continuously in long tunnel kiln. Interesting dust control system

IN THE NEW LESLIE PLANT of Harbison-Walker Refractories Co., Leslie, Md., as at the new Windham, Ohio,* plant, two types of silica refractories are manufactured, Star brand of the conventional class and Vega brand of the super-duty class. The plant was begun in 1954 and completed early in 1955. Leslie Works is the third silica brick plant built by Harbison-Walker.

The plant site was carefully selected for its closeness to raw material and to important consuming industries. The raw material originates in a quarry within a few miles of Leslie. The consumers are mainly located in the vicinity of Baltimore, eastern Pennsylvania, and other points near the Atlantic Seaboard. The plant is located approximately half-way between Baltimore and Philadelphia, and is well situated for both railroad and truck shipments.

*ROCK PRODUCTS, September, 1955, p. 114

Raw Material Handling

All of the raw material is received at the plant by dump trucks, after having been previously washed, beneficiated, sized and carefully selected for quality control. The trucks climb a 2 percent graded ramp and deliver the material into a large receiving hopper or onto adjacent stockpiles. Since the raw material is moist as received, virtually no dust is created during unloading. An apron feeder and a belt conveyor deliver an electrically controlled flow of the silica pebbles to the grinding plant. Calcines are handled by lift truck through a jaw crusher onto the same electrically controlled conveyor system. The units are self-emptying and adequately protected by signal systems to assure operational simplicity.

The hydrated lime used as the bonding agent is delivered to the plant in sacks of the exact weight required per batch. It is received, palletized and stored by lift trucks. This material and other binders can be received with equal convenience either by railroad or truck.

Grinding Process

The raw material is fed by an apron feeder and belt conveyor to a totally enclosed dry pan grinding mill. The product from the grinding mill is separated by an electrically vibrated screen

(Continued on page 122)

Looking down 504-ft. tunnel kiln with discharge end to the right

Aerial view of the $15,000,000, 2000 t.p.h. high calcium fluxstone plant. The quarry, stone plant and 500,000-ton stockpile area are in the background, and the loading dock, weigh house, and dolomite stockpile (for blending purposes) are in the foreground

OPERATION FLUXSTONE

• Presque Isle Corp., Presque Isle, Mich., a joint venture of five major steel companies, has constructed a new $15,000,000 fluxstone plant in northern Michigan. Plant is operated and managed by Chemstone Corp., Cleveland, Ohio

By KENNETH A. GUTSCHICK

THE NEW $15,000,000 FLUXSTONE PLANT of Presque Isle Corp., located at Presque Isle, Mich., is expected to ship 4¼ million tons of high calcium limestone during its first year of operation. A joint undertaking of five major steel producers, the plant was built to insure these companies of adequate supplies of high grade metallurgical limestone for the future. Companies involved in the multi-million dollar venture include Republic Steel Corporation, Bethlehem Steel Co., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co., and Great Lakes Steel Corp. The plant is managed and operated on a fee basis by Chemstone Corp., Cleveland, Ohio, (formerly Kelley Island Lime & Transport Co.). Having a capacity of 2000 t.p.h., Presque Isle is the second largest fluxstone plant in the United States.

Situated near the head of Lake Huron, the high-capacity plant is presently shipping its entire production by boat to steel, lime, and portland cement plants located at or served by Great Lakes ports. The first shipment was made on April 10, 1955, although production was started in December, 1954. Principal uses of the stone are for both blast and open hearth furnaces, with cement and lime manufacturing being of secondary importance. Shipments are also made for use as aggregates and fill.

The Presque Isle plant was first conceived by Kelley Island officials about five years ago, shortly after its fluxstone plant at nearby Rockport, Mich., was shut down. Kelley Island had been operating a plant and dock at Rockport since 1922, obtaining high calcium limestone first from an adjacent quarry and (after 1932) from a

Two views of the traveling shuttle boom boat loader taken from opposite sides. Left: Shuttle conveyor L3 is lowered down into the cargo hold to reduce stone fall. Right: Conveyor L2 elevating stone to the shuttle boom conveyor. Operator's cab is on the loader platform, to the right, in the illustration

Stockpiling area, showing belt conveyor stackers mounted on a 60-ft. high berm

new quarry at Presque Isle (the present P.I.C. quarry). However, by 1948, the plant's obsolete equipment and facilities, coupled with a 7-mi. rail haul, made the operation too costly, and the plant was shut down.

At Presque Isle the quarry, plant, and dock are located side by side, thereby effecting a short haul from quarry to dock. The entire operation is highly automatic and was designed for sustained high capacity and low maintenance. A distinctive feature is the simplified flow sheet which incorporates a relatively small number of crushing and screening units. However, all of the machinery is of latest design and of extra heavy duty construction. Major production units in order of flow include a 60-in. primary gyratory crusher producing minus 10-in. stone, two 6- x 12-ft. scalping screens, a 30-in. secondary gyratory crusher producing minus 5½-in. stone, and three batteries of four 6- x 14-ft. finish screens in series. Basic stone sizes produced include 10 x 5½, 5½ x 3½, 3½ x 1½, 1½ x ¾, and ¾ x 0 in. Production of additional commercial aggregates and agstone is anticipated for the future.

The plant also features an outstanding stockpiling and boat loading system. Stockpiling is handled by six stackers (five self-propelled and one stationary), which are mounted on a 60-ft. high by 1700 ft. long berm extending from the screen house toward the dock. The stackers ride on two sets of rails, delivering to longitudinal stockpiles having a total capacity of 500,000 tons. Each stacker has a 75-ft. boom conveyor which can be pivoted through a 38 deg. arc (18 deg. up or 20 deg. down from the horizontal); booming down reduces the stone drop, thereby lessening breakage of material, while booming up permits the building of maximum size stockpiles (in this installation, about 100 ft. high).

Stone from each of the two paralleling stockpiles is reclaimed through special-designed chute cars to a 1418-ft. long tunnel belt conveyor, which leads to a pair of 6- x 16-ft. scalping screens; these units remove the undesirable fines resulting from degradation in the stockpiles.

The boat loading dock, 1100 ft. in length, was constructed 1000 ft. offshore and is connected to the mainland by a causeway. Stone is delivered to the dock weighouse and then to a travelling shuttle boom boat loader which is patterned after the stackers. The travel feature permits the boat to be moored in a fixed position while the loader moves from hatch to hatch. Besides having a travel motion (of 460 ft.), the boat loader has a 102-ft. long shuttle boom conveyor loader, the lower half of which can be pivoted through an 18-deg. arc below the horizontal. This hoisting arrangement allows the loader to extend partly into the cargo hold, thereby minimizing the stone fall. The shuttle arrangement, in addition, permits the vessel load to be trimmed.

Another interesting feature at Presque Isle is the automatic limestone-dolomite blending operation carried on at the loading dock for steel com-

Looking down the stacker berm from the screenhouse. Delivery to stockpiles is by means of five self-propelled stackers and one stationary stacker

Quarry scene showing a rotary drill and an 8-cu. yd. electric shovel loading a 20-ton truck

Close-up of an 8-cu. yd. shovel loading a tractor-trailer unit

panies requiring a small amount of MgO in blast furnace flux. Dolomite is imported in self-unloading vessels and stockpiled on the dock over a reclaiming tunnel. Blending is done automatically on belt conveyors through use of individual Merrick Weightometers operated in conjunction with a Speedomax recording device.

The use of Weightometers at Presque Isle for purposes other than boat loading is of interest. Besides the two units installed at the dock, there are seven other units in operation. One is mounted on the primary belt conveyor and records quarry production in tons per hour. There is one unit on each of the stockpiling belt conveyors which permits accurate stockpile inventory control; this information in turn is used to govern plant operations.

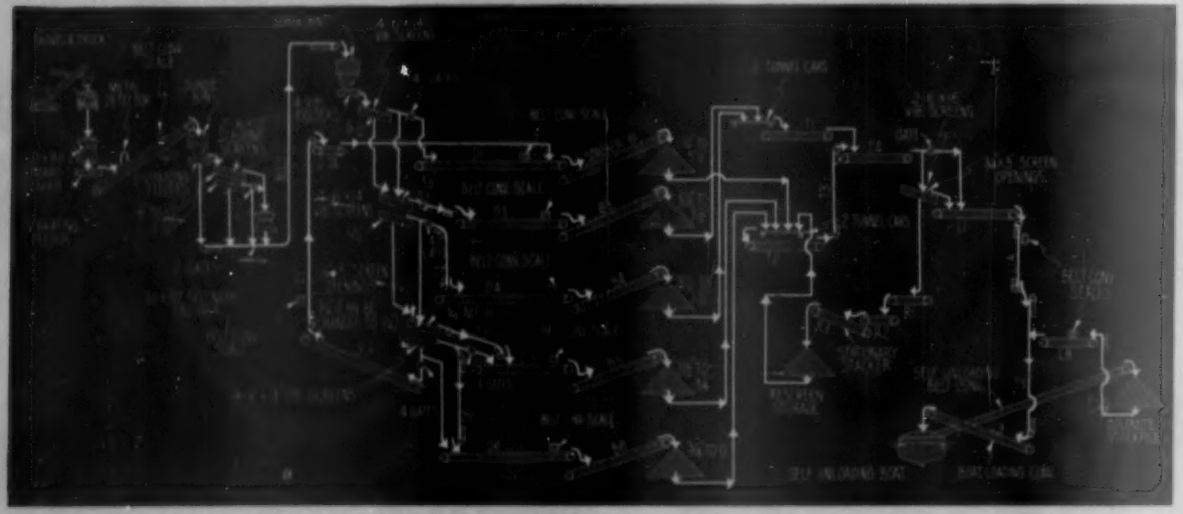
Intraplant transportation is exclusively via an elaborate belt conveyor system. From primary crusher to dock, the stone is transported approximately one mile on conveyors varying in width from 30 to 72 in. and from 16 to 1418 ft. in length. Altogether there are 32 separate conveyor flights measuring over 13,000 ft. in total length and carrying a total of 5.2 miles of conveyor belting. Connected horsepower for these conveyors totals 3610 hp. Belt speeds range from 320 to 550 f.p.m., and tonnages handled are as high as 4500 t.p.h. as in the case of boat loading. Several design features of the conveyor system, including the use of step starters, dual drives, emergency stop cords, will be described later.

Additional features of the Presque Isle operation to be discussed later herein include quality control in the quarrying operation, unique grounding system used both in the quarry and plant, extensive interlocking of machinery and conveyors, and use of surge bins throughout the plant which are served by vibrating feeders.

Quarrying Operation

In renovating the 173-acre Stoneport quarry, the company had to pump out over 500 million gallons of water which had collected during the 5-year period the quarry was idle. The pumping operation was completed in 21 days through use of a 20-in. electric pump. The primary crusher station was erected on the old quarry floor near the stone plant.

The quarry penetrates the basal portion of the Rogers City formation (of Devonian age), which along with underlying Dundee formation (also Devonian), comprise the main sources of high calcium chemical and metallurgical limestone presently being quarried in the United States. In the Presque Isle area the Rogers City formation consists of an upper zone of high calcium limestone averaging 40 ft. in thickness. A typical chemical analysis of the stone is as follows:



Flowsheet of the entire Presque Isle operation—from quarry to boat loading

Layout of the Presque Isle Corp. quarry, fluxstone plant, and dock facilities, with selected cross-sections

	Rogers City Limestone
CaO	53.98
MgO	.70
Fe_2O_3, Al_2O_3	.32
SiO_2 and insolubles	1.28
Sulphur, Sulphates	.06

At the present time the quarry is being developed to the bottom of the Rogers City limestone strata, and thus has an average face of 40 ft. As an integral part of the quarry operation, the company carries out a core drilling program. The general practice is to obtain cores on 200- x 200-ft. centers, drilling partly below the Rogers City zone. The cores are analyzed by the plant chemist, and the heighth of face determined at each working face. Cores, 2¼ in. in diameter are obtained with a Longyear and a Sprague & Henwood diamond core drilling machine.

Overburden, consisting of glacial clay, gravel and boulders, averages 11 ft. in thickness. It is being removed on contract by means of scraper-bulldozer teams. During the winter shutdown, the company plans to use its own shovels and trucks, presently on quarry duty, for overburden removal. In order to prevent contamination of quarry-run stone, the overburden is completely removed from the bedrock surface.

Primary blast holes (6½-in. dia.) are put down by five Joy 58BH Heavyweight Champion rotary drills (one spare), utilizing 5½-in. Hughes Tri-Cone bits. The drilling rate of each unit averages 30 f.p.h. The holes are drilled with 20-ft. burden and 24-ft. spacing, and shot in single rows, generally as many as 60 holes at a time. DuPont explosives (Gelex No. 1 and 50 percent Red Cross) are presently being used, although the company expects to switch to Nitramon A and Nitramite. Because coarse sized products are desired, wide spacings and low dynamite requirements are possible; yield averages approximately 4.75 tons of stone per lb. of explosive. Primacord and Primacord ms. delay connectors are used to detonate the explosives. With the use of high capacity shovels and large primary crusher, secondary shooting is practically unnecessary.

Quarry loading is handled by three 8-cu. yd. Bucyrus-Erie 190B electric shovels, each handling 10 tons of stone per digging cycle or about 700 t.p.h. These shovels are new models, featuring a two-section boom design with twin dual hoist ropes for the bucket, a tubular dipper handle, and a Westinghouse Rototrol (rotating control) drive. The latter affords quick response and smooth acceleration and deceleration of the hoist, crowd, and swing motors; this results in ease of operation and high output.

The truck haulage fleet consists of nine Euclid 36TD end-dump trucks carrying 20 tons each, and four Euclid tractors — Easton TP2736 side-dump trailers carrying over 30 tons each. The average one-way haul distance is about 1400 ft. A Caterpillar road patrol grader and an Allis-Chalmers HD20 tractor-bulldozer round out the quarry equipment.

A special safety feature of the quarry operation is an impedance-grounded electrical distribution system designed to eliminate accidents caused from electrical hazards. The system incorporates a neutral establishing zig-zag transformer, a grounding resistor, and a circuit breaker mounted on the quarry feeder pole line (see photo).

Primary crushing station with two end-dump trucks and one side-dump trailer discharging simultaneously into the 60- x 89 gyratory crusher. Primary conveyor, secondary crusher building and screenhouse are in the background

One of the heavy duty 6- x 12-ft. scalping screens fed by a vibrating feeder. Top deck screen openings are 8 and 10 in. square. Note heavy chains at feeder discharge point

Dual Vibrating feeders serving the 500-ton surge bin in the screen house. Low level bin indicator may be seen above

When a ground fault or ground connection occurs in the 4160-volt system serving the shovels and rotary drills, the ground fault current is limited to 25 amp. by the grounding resistor, and the voltage drop in the ground wire or ground connection will not cause a dangerous rise of potential above earth, of the wire or the frames of any equipment connected to it. In addition, there is a current transformer in the lead between the transformer neutral and ground, connected to a relay which is arranged to trip the circuit breaker when a ground fault occurs in the system. Clearing of the circuit is extremely rapid, occurring in 0.2 sec. Thus a mistaken hook-up or accidental ground would be cleared in time to prevent injury. There is also an overhead shield wire mounted on the quarry feeder pole line which connects to all quarry equipment; it serves as a ground wire of low impedance and lowers the resistance to ground to five ohms or less. It provides a safety factor during electrical storms.

Power for operation of the shovels and drills is supplied through four skid-mounted portable weatherproof switch houses, each having three outlets. Simplex SHD cable is used for the shovels and drills.

Primary Crushing

The primary crusher, placed below the quarry floor, is a 60 x 89 Allis-Chalmers Superior gyratory unit, which is driven by a 350-hp., 720 r.p.m., 4160 volt, wound rotor induction motor through a Texrope V-belt and jackshaft drive. Certain parts of the crusher, including the spider, top shell, middle shell, head center, and eccentric were constructed of high test iron instead of cast steel; the total crusher weight (erected) is 404 tons. The crusher is fitted with a special Hydroset suspension mechanism, with which vertical adjustment of the crusher head is obtained hydraulically; the mechanism consists of a motor-driven gear oil pump operated by push button. An integral part of the Hydroset is a pressure relief device called an Accumulator, which automatically increases the crusher opening to allow large-sized pieces of tramp iron to pass through without causing damage to the crusher. The crusher opening (open side) is normally set at 8½ in., the eccentric throw being 1½ in.

Circuit breaker, "zigzag" transformer, and grounding resistor mounted on the quarry feeder power line which reduces high voltage electrical hazards

The crusher is served by an overhead travelling P & H 15-ton crane carrying a single hoist and hook for loosening hung up blocks. The crane has a 25-ft. span and a 50-ft. runway, and the hoist has a 50-ft. lift. The hoist motor is a 40-hp. wound rotor motor, while the bridge and trolley motors are 7½- and 5-hp., respectively. For dumping the side-dump trailers, there is a conventional Easton hook swing bridge, which is powered by a 75-hp. high torque high slip induction hoist motor; this motor has a reversing magnetic starter.

An interesting feature of the crusher is that the haulage units can dump from three sides, and because of the large feed opening, three truck loads (over 70 tons of stone) can be discharged simultaneously. The crusher has a bottom discharge opening leading to a 200-ton steel surge bin. This bin is equipped with special high and low level indicators for controlling the level of stone in the bin; each indicator consists of a heavy hinged plate which swings out when stone presses against it, thereby engaging a switch which operates a light and buzzer in the primary crusher operator's control room. The crusher is operated so there is

First floor of screenhouse, showing the S5 and S6 conveyors discharging to the D5 and D6 stacker belt conveyors. Conveyor S7 is on the far right. Note interesting chute arrangement and close fitting skirt boards

Battery of three belt conveyor scales serving the D5, D6, and D7 stacker belt conveyor. Close inventory control of stockpiles is made possible by these scales

always a bed of material on the electric vibrating feeder mounted beneath the bin.

Feed to the primary belt conveyor is effected by a twin dual F86 Syntron vibrating grizzly feeder, which is the largest ever built by Syntron. The pan, sloping at 15 deg., measures 96-in. wide by 10 ft. long, and has a 35-in. grizzly discharge section; the grizzly allows the fines to cover the primary conveyor belt and thus cushion the fall of the larger particles from the feeder. Excitation for the feeder, which actually consists of four vibrating units, is by a Thyratron tube-type control operated on 440-volt, 60-cycle current. This control has a built-in timer which allows the tubes to warm up before use. Based upon a 4-ft. gate opening, the feeder is rated at 2500 t.p.h. An important feature is that the feeder is manually regulated from two control stations—one local and one remote. The latter is located in the control room of the screen house, and permits the screen house operator to automatically vary the rate of feed of material coming to the finish screens. This contributes greatly to keeping the plant running at peak capacity.

The primary conveyor (No. 1) is a 54-in. by 600-ft. unit, which elevates the primary crusher product to the top of the secondary crusher building. The conveyor is housed for about one third of its length in a concrete tunnel leading out of the quarry, and in a conventional conveyor gallery the remainder of the distance. The drive is tandem, consisting of two 250-hp. wound rotor motors, each driving through a herringbone gear speed reducer and flexible couplings; the belt speed is 515 f.p.m. The conveyor is equipped with a special heavy duty Model E Merrick Weightometer for recording plant production and an R.C.A. electronic metal detector for detecting all kinds of tramp metal, including manganese. Besides stopping the belt, the device sets off warning lights and bells in the primary and secondary crusher control stations and also in the primary conveyor drive house.

Secondary Crusher Building

In the secondary crusher building the stone is discharged to a surge bin mounted over a pair of dual F86 Syntron vibrating grizzly feeders, each of which serve a scalping screen. Each feeder pan measures 60 in. wide by 6 ft. long and is sloped at 10 deg. In contrast to the primary feeder, these feeders have only local control; otherwise they are similar in construction to the primary feeder. Material through the 34-in. long grizzly sections (minus 4-in.) bypasses the scalping screens and secondary crusher, while the balance is fed to the screens. Short heavy chains are mounted at each feeder discharge point to control the feed even further.

The two scalping screens are 6- x 12-ft. Tyler Tyrock F900 extra heavy duty two-deck units which are driven by 25-hp., 440-volt high starting torque squirrel cage motors. The top deck of each screen is fitted with one section of bar grizzly with 8 in. square openings and one section with 10 in. square openings, while the bottom deck has ½-in. thick steel perforated plate with 5½-in. square openings. Each screen has a capacity of 1100 t.p.h. Top deck rejects are fed to the

Battery of four 6- x 14-ft. intermediate screens which produce two sizes of blast furnace fluxstone

Close-up of one of the belt conveyors, showing the emergency stop cord, switch and counterweight, and rubber impact idlers. Pulley shaft is mounted on roller bearings

crusher, while bottom deck rejects may or may not be fed to the crusher, depending upon the top size stone desired. Minus 5½-in. stone bypasses the crusher.

The secondary crusher is an Allis-Chalmers 30-70 Superior gyratory crusher, also equipped with the Hydroset suspension mechanism; it was constructed with cast steel, with the exception of the wearing surfaces which are manganese. The crusher is V-belt driven by a 250-hp., 720 r.p.m., 4160-volt, Allis-Chalmers wound rotor motor. A 24-ton capacity chain hoist, mounted on a 24-in. I beam, serves the crusher.

Screen House

Flow to the screen house is via a 54-in. by 438-ft. inclined belt conveyor (No. 3) operated at 550 f.p.m. The conveyor drive is also tandem, consisting of one 125-hp. and one 200-hp. wound rotor motor, each connected by flexible coupling to a herringbone gear reducer. The conveyor discharges via stone box to a 500-ton steel surge bin, which has four hopper bottoms, with one vibrating feeder serving each hopper.

Through a special internal chute arrangement the material is rather evenly distributed across the bin and segregation is minimized; this effects fairly uniform feed to the battery of four screens below and consequently promotes efficient screening. This particular bin structure was designed because of the difficulty of getting a uniform four-way split of material discharging from a belt conveyor. The bin has high and low level indicators, with indicating lights on the screenhouse control panel. The low level indicators are placed immediately above each hopper bottom.

The vibrating feeders are dual F86 Syntron units, each carrying a 60- x 66-in. pan mounted on a 10 deg. slope. They are similar in construction to the other feeders but lack the grizzly section. The feed rate of each unit is controlled locally, and is normally 500 t.p.h.

The screen house is a six-storied structure having three screening floors, each equipped with four extra heavy duty 6- x 14-ft. Tyler Tyrock F800 screens. The top tier of screens are single deck, the other two are double deck; drive motors consist of 20-hp. 440-volt, high starting torque squirrel cage induction units. The screens are arranged in series, so that if one unit is not operating, only one line of screens has to be shut down. Since each line has a capacity of 500 gross t.p.h., the plant can run at near rated capacity with only three lines operating. Five sizes of stone are normally produced, including open hearth stone (10 x 5½ in.); two sizes of blast furnace stone (5½ x 3½ in. and 3½ x 1½ in.); rotary lime kiln and aggregate stone (1½ x ¾ in.); and cement stone (¾ x 0 in.). There is also provision to produce upon demand ¾ (or 1 in.) aggregate stone and agricultural limestone (¼ x 0 in.).

For producing the above basic sizes, the following arrangement is currently used. The top tier of screens, mounted on 25-deg. slopes, are fitted with 7/16-in. thick perforated plate having 5½-in. square openings. Oversize stone, representing open hearth, is belt conveyed to the stockpile area, while the throughs are chuted to the second tier of screens. To promote maximum screening efficiency and to check degradation, the load over the deck is slowed down by means of two suspended 30-in. conveyor belting flaps, each partly cut into three strips. Heavy chains (seven in number) mounted in the chute at the screen discharge point also serve to check stone velocity and reduce chute wear. By means of a flop gate in each chute, oversize stone can also be fed to the second tier of screens; this practice will be followed when the plant is producing agstone and the stacker conveyor normally used for transporting open hearth stone will be used for agstone instead.

The intermediate tier of screens has Tyloy No. 77 wire cloth with 3½-in. square openings on the top deck and 1½-in. square openings on the bottom deck, producing two sizes of blast furnace fluxstone; the throughs are chuted to the third screen battery. Individual conveyors deliver the fluxstone to stockpile. Gates are available so that the bottom deck rejects can also be directed to the screens below.

During the writer's visit, the bottom screens were delivering only two products—1½ x ¾ in. and ¾ x 0 in.; however, both decks were being used in order to attain maximum screening efficiency. The top deck was fitted with a one-third section of Tyrod 1¼ x 5-in. openings, the balance of the top deck and the bottom deck having wire cloth with ¾-in. square openings. The Tyrod section serves to distribute much of the load to the bottom deck. For agstone products, the bottom decks will be fitted with ¼-in. openings.

To provide flexibility in the production of small sizes, there are individual flop gates on the two sets of chutes following the screens. This will enable bottom and top deck rejects to be joined or separated and bottom deck rejects and throughs to be joined or separated. The flop gates are built with limit switches with indicating lights on the screen house control panel; this enables the operator to readily ascertain the position of all chutes at the control room. The gates must be in the proper position, and the correct conveyors running before the feeders in the screen house can be started.

Delivery to the stockpile area is entirely by belt conveyors, as identified on the accompanying layout drawing. Open hearth stone is carried directly to the B1 stacker by 36-in. conveyor D1 (696 ft. centers), while the other products are transferred in two stages. The two fluxstone products move on the 36-in. S3 and S4 conveyors (58½ ft. centers) to the 36-in. stacker conveyors D3 and D4, respectively, while the finer products move on the 30-in. S5, S6, S7 conveyors (73 ft. centers) to

the 30-in. stacker conveyors D5, D6 and D7. Lengths of the stacker conveyor flights are as follows: D3, 716 ft.; D4, 1067 ft.; D5, 1235 ft.; D6, 1013 ft.; and D7, 220 ft. Conveyor D7, carrying agstone, connects to the D1 conveyor via a 16-ft. cross conveyor. All stacker conveyors (except D7) are driven at 385 f.p.m. by 75-hp. motors (for D1, D3, and D4) or 50-hp. motors (for D5 and D6). Conveyor D7 is driven at 320 f.p.m. by a 30-hp. motor. Maximum tonnage handled by each stacker is 600 t.p.h., except D1 (900 t.p.h.) and D7 (300 t.p.h.). A Merrick Model E Weightometer is mounted on each stacker conveyor for weighing and totalizing the material load. As mentioned earlier, this information is used for close inventory control of stockpiles.

Stockpiling and Reclaiming

The berm on which the five travelling boom stackers and one stationary boom stacker are mounted measures 1700 ft. long, and is 180 ft. wide at the base and 60 ft. wide at the top. It was constructed of quarry strippings obtained from the stripping dump east of the plant site; sheep's foot rollers were used to compact the fill in layers not exceeding 2 ft. in thickness. The top of the berm is veneered by a 1-ft. layer of beach gravel used for embedding the two stacker rail lines which parallel the stockpiles. To prevent erosion before the beach gravel was placed, the top 6 in. of the berm fill was stabilized with hydrated lime.

Two of the movable stackers (D3 and D4) are mounted on one set of rails, and the others are on the second rail line; in the latter case Conveyor D1 is mounted over D5 for part of distance. The stackers are propelled at a maximum speed of 54 f.p.m. by two 20-hp. reversing squirrel cage gearmotors (one to each set of trucks). Hoist motors for the 75-ft. long (B) boom conveyors are 15-hp. units similar to the travel motors. Inside and ground level push button stations are mounted on each stacker —the inside unit can be used for both travel and boom operations, while the ground level panel is for travel only. The stacker wheels are double-flanged, and the track of 115-lb. construction. Each stacker has two counterweighted rail clamps operated from a small gearmotor. These clamps automatically engage when the stacker motion is stopped, and prevent movement during the stockpiling operation. Each stacker is interlocked with its D and B conveyor, so that it cannot be moved unless the conveyors are operating. Stackers 3 and 4 each have a travel range of 288 ft.; stackers 1 and 6, 256 ft.; and stacker 5, 160 ft. Limit switches are mounted on the stacker frame to prevent stacker movement beyond the specified travel distance. The accompanying layout drawing shows the stockpile area and indicates the position of the stackers and size of stockpiles.

One of the electric tunnel chute cars delivering 3½- x 5½-in. fluxstone to the 60-in. reclaiming belt conveyor. Clamshell gate is opened by a handwheel through a reducer and chain drive

As mentioned earlier, each stacker has a pivoted boom which can be raised or lowered through a 38 deg. arc in accordance with the height of the stockpiles. This keeps the stone drop to a minimum, thereby minimizing degradation and breakage.

Each longitudinal stockpile is reclaimed to a 60-in. by 1418-ft. tunnel belt (T) conveyor through clamshell gates spaced on 16-ft. centers. The tunnels are of concrete construction, measuring 9 ft. 9 in. x 13 ft. in cross-section, and 1000 and 1400 ft. in length, respectively. Discharge of stone to each belt is via self-propelled track-mounted chute cars (two to a tunnel). The cars are equipped with a 24-in. hand wheel, Dodge Torque-Arm reducer and chain, for manual opening of the tunnel gates.

Each car is self-propelled by a 15-hp. reversing squirrel cage motor; for convenience, there is a push button travel control on each side of the tunnel car. Use of two tunnel cars in each tunnel permits blending on the reclaiming conveyor if necessary.

Both tunnel belt conveyors lead to a junction house (one directly and the other, via a 60-in. by 175-ft. cross conveyor), followed by a 60-in. by 182-ft. conveyor which transfers the stone to the rescreening station. Two screens, 6- x 16-ft. Tyrock F800 extra heavy duty single deck units, are used to scalp off fines formed during the stockpiling and reclaiming operations. The ¾ x 0-in. size bypasses the screens by means of a flopgate. Each screen is driven by a 25-hp. high starting torque squirrel cage motor and is fitted with ½-in. perforated plate having 3- x 1½-in. openings which are staggered and parallel to the flow of material. Heavy perforated plate rather than wire cloth is required to handle the coarse stone sizes. Fines scalped off during rescreening are returned to storage by means of three 30-in. (R) belt conveyors in series, which have 114-, 569-, and 78-ft. centers, respectively. The latter conveyor is the pivoted stacker boom conveyor, which discharges to a 10,000-ton stockpile. The rescreen stacker is of similar construction to the other stackers, but is mounted permanently.

Boat Loading Operation

In order to accommodate large bulk carriers and self-unloading vessels, the company constructed an artificial dock at a cost of nearly $2,000,000. The structure consists of a 1000-ft. causeway connected at right angles to an 1100-ft. loading dock. Vessels are loaded on the shorewardside of the dock. The causeway, measuring 75 ft. wide (200 ft. wide at lake bottom) is built with stone fill and flanked with a 6-ft. layer of rip rap; it has three 54-ft. dia. cells placed at the junction with the dock. The cells are made of interlocking steel sheet piling driven to bedrock and filled with beach gravel and stone fill. A special template handled by a Manitowoc 4500 crane was used in setting the piling.

The dock is built with 19 similar-type cells flanking the entire length of the onshore side. The dock fans out to a width of 300 ft. to accommodate a stockpile of 30,000 tons live storage

Looking down 60-in. boat loading belt conveyor L2; dolomite stockpile to the right

capacity for imported dolomite. Quarry strippings, beach gravel, and stone were used for dock fill. A 6-ft. layer of rip rap lines the lakeward side for shore protection; it rises about 8 ft. above dock level, or 19 ft. above the lake level. To provide a good foundation for the concrete reclaiming tunnel under the dolomite stickpile, H-bearing piles were driven through the fill to lake bottom along the tunnel axis.

Shiploading is an around the clock operation, and is not contingent upon the plant running. It is only necessary to operate the particular tunnel conveyor, rescreening station, return fines conveyors, and dock conveyor system for boat loading.

The dock conveyor system consists of four belt conveyors in series for handling limestone, and two additional conveyors for dolomite. The limestone conveyors include (1) a 60-in. x 1056-ft. unit (L1) mounted on the causeway and leading to the weighhouse station, (2) a 60-in. x 75-ft. unit (L1A) located in the weigh house at right angles to L1 and on which is mounted a Merrick Model E Weightometer, (3) a 60-in. x 747-ft. unit (L2) paralleling the dock and leading to the travelling boat loader, and (4) a 72-in. x 102-ft. shuttle boom conveyor (L3) used for boat loading. The drive motors for conveyor L1, L1A, L2 and L3 are 300-hp., 75-hp., 200- and 150-hp. (tandem), and 100-hp., respectively. This system has a capacity of 4500 g.t.p.h., with belt speeds varying from 550 f.p.m. for the L1 and L2 units to 440 f.p.m. for the shuttle boom conveyor. The velocity of the latter conveyor is reduced mainly in order to check stone breakage during the loading operation.

The boat loader has a unique design, being patterned after the self-propelled stackers used for stockpiling. But in addition to having travel and boom motions like the stacker, the boat loader also has a shuttle motion. The shuttle loading out conveyor (102 ft. centers) is hinged at the midpoint, and the lower half can be hoisted through a 20 deg. arc below the horizontal. This booming arrangement allows the conveyor to extend partly into the cargo hold, thereby minimizing the stone fall. The shuttle arrangement permits the vessel load to be trimmed. The shuttle conveyor has a travel of about 38 ft., and is driven by a 100-hp. motor.

The travelling loader is a self-propelled structural trussed frame, with traversing speed of 70 f.p.m. The rail line extends for 460 ft. and allows the loader to move from hatch to hatch while the boat is moored in a fixed position. This effects faster loading than if the boat had to be moved rather than the loader. The entire loading operation is push-button controlled by one man stationed in a glass-enclosed cab projecting from the loader over the dock.

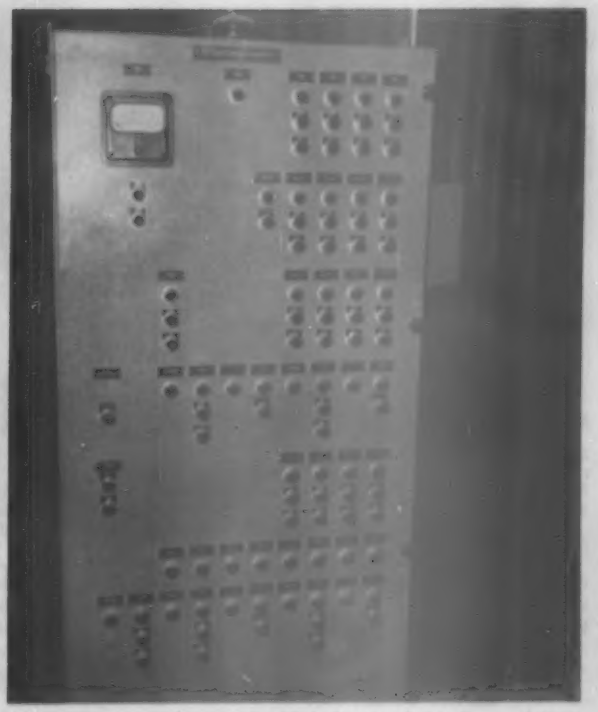
Limestone-Dolomite Blending

For certain steel companies that require a small amount of MgO (generally 6 to 8 percent) in fluxstone, the company has set up a special limestone-dolomite blending circuit at the docksite. Since the Rogers City limestone being quarried has less than 1 percent MgO, it is necessary to blend this stone with high purity dolomite, which is imported in self-unloading vessels from nearby quarries at Cedarville and Drummond Island, Mich. The vessels unload to stockpile from the onshore side of the dock. A 42-in. x 441-ft. reclaiming tunnel belt conveyor (L7) and a 42-in. x 116-ft. conveyor (L8) at right angles deliver the dolomite to travelling boat loader conveyor L2.

Blending is done automatically and accurately by means of individual Weightometers (on the L1A and L8 conveyors) operated in conjunction with an L & N Speedomax installed in the weigh house. The operation consists of setting a predetermined ratio of limestone: dolomite on the Speedomax and starting both conveyor systems. The limestone conveyor (L1A), running at a constant speed, actuates the dolomite tunnel conveyor (L7), which is driven by a 60-hp. 250-volt d.c. variable speed motor at a maximum speed of 450 f.p.m. and having a maximum capacity of 1500 g.t.p.h. If the limestone load on L1A changes, the speed of L7 automatically changes so that the limestone: dolomite ratio remains the same. The Speedomax is designed to graphically record the t.p.h. feed of both limestone and dolomite and also the total feed.

Left to right: Robt. H. Allen, general superintendent; Wm. H. Wright, night superintendent; Norman D. Schafer, general manager; and Chester E. Kukulski, resident supervising engineer, John F. Meissner Engineers, Inc.

Control panel for the limestone-dolomite blending operation with instruments indicating individual and total weights of limestone and dolomite delivered to the boat loader



Screenhouse operating panel with indicating lights for machinery and conveyors. Instrument at top, left, indicates rate of feed of material from primary crusher; rate regulated at this point

Ratios are determined by means of simple proportion. For example, with the dolomite, having an average MgO content of 20.5 percent, a blend of 2.87 limestone: 1 dolomite will give a blended product having 6 percent MgO; and 1.98 limestone: 1 dolomite yields a 7.5 percent MgO content. Several times during boat loading, the Speedomax graphs are checked to insure accurate blending. Using this system the company has been able to blend to the close tolerance of .03 percent.

Conveyor Details

The company spared no expense in designing the conveying system for maximum efficiency. Belting was specified with generous ply, weight, and top and bottom cover. Five ply represents the minimum ply, and is used on 75 percent of the conveyors; these same conveyors have ¼- or $\frac{5}{16}$-in. top covers. The heavy duty belts have ⅜-in. top cover and vary in ply from 6 to 9. The primary 54-in. conveyor is 9 ply and incorporates extra heavy rayon. The two 60-in. reclaiming tunnel conveyors (T1 and T2) are 8 ply and are also made of rayon. Seven-ply belting (48 oz. or 42 oz.) is used for the 54-in. secondary conveyor (No. 3), and also for the 60-in. T3, T4, and boat loading conveyors L1, L1A, and L2. The 72-in. shuttle boom belt (L3) is 6-ply. All belting splices at Presque Isle are vulcanized.

To extend belt life, heavy duty soft rubber impact idlers and close-fitting skirt boards are used at all loading points. All drive pulleys have rubber-lined chevron lagging for removing moisture. Self aligning anti-friction roller bearings are used for all conveyor pulley shafts rather than friction bearings; they have longer life and are more easily maintained. The majority of outdoor conveyors are adequately protected from weather by arched corrugated steel roofs and steel windguards. Hold down pulleys are installed on the stacker conveyors at the vertical curve positions; they were needed during cold weather start-up to keep the belt from lifting too high above the idlers. All inclined conveyors are fitted with Wonway Clutch Co. backstops; in the case of the three inclined tandem drive conveyors (1, 3 and L2) there is one backstop on each drive pulley.

Three types of conveyor drive motors are used. For the large conveyors driven by motors exceeding 100 hp., wound rotor motors (4160 volt) with step starters are used. The steps vary from five to eleven, depending upon the belt size; their function is to limit the starting torque to less than 150 percent of normal. Squirrel cage motors (440 volt) with reduced voltage starters are used for the conveyor drives varying in horsepower requirements from 25 to 100 hp. Conventional squirrel cage motors are used for the smaller conveyors.

Centrifugal switches (governors) are installed on all conveyor belt tail pulleys. If a tail pulley is not operating at its proper speed, the centrifugal switch automatically stops the conveyor drive motor; and through interlocking, the units in back of the conveyor are stopped.

All conveyors are fitted with emergency stop cords, which are conveniently mounted along the conveyor frames. Each cord, made of $\frac{5}{16}$-in. galvanized steel cable, connects to a counterweight which throws the switch stopping the conveyor (see photo). The belt cannot be started until the emergency switch is manually reset. The switches are spaced about 250 ft. apart, with the cords extending along the entire length of each conveyor.

Electrical Distribution System

Electrical power, purchased from the Consumers Power Company of Michigan, comes in at 140,000 volts and is reduced to 4160 volts by three oil-cooled single-phase outdoor-type 2500 kv.a. transformers. Five 4160-volt feeder centers and four substations distribute the power throughout the plant. Feeder No. 1 serves the primary and secondary crusher buildings, the primary conveyor drive, and the 500 kv.a. substation which furnishes 440-volt current to the above locations plus the office, garage, machine shop,

Some of the operating official personnel at Presque Isle. Top row, left to right: V. Kryst, maintenance superintendent; C. V. Wade, maintenance foreman; T. W. Connon, quarry foreman; E. Nowak, night quarry foreman; and H. C. Dewey, millforeman. Bottom row, left to right: J. Schuler, night mill foreman; H. Anderson, assistant maintenance foreman; V. Brousseau, marine loading foreman; and B. Lamb, chemist

and warehouse; Feeder No. 2, the screen house, stackers, and the 1000 kv.a. load center supplying 440-volt to these units; Feeder No. 3, with its 500 kv.a. substation, the tunnel reclaiming system; Feeder No. 4, with its 500 kv.a. load center, the rescreening station, weigh house, and boat loading system; and Feeder No. 5, the quarry.

Each operating department has its control center, consisting of control and operating panels. In the case of the larger buildings, the panels are located in pressurized control rooms; in other locations, the panels have their own filter air duct and fan. Internal static pressure in the control rooms is provided by small ILG centrifugal fans (about 1500 c.f.m. capacity).

A special grounding system was installed because of poor natural grounding conditions in the area. The system consists of an elaborate network ground incorporating braided copper wire which ties together all buildings, conveyors, substations, and dock sheet piling to a 70-ft. deep ground well. The overhead shield wires in the quarry are also connected to the system. The resistance to ground is less than 5 ohms. Lightning arrestors are provided on the main transformer station.

Construction Details

Buildings and conveyor galleries at Presque Isle were constructed with extra heavy structural steel and enclosed with corrugated galvanized steel siding and roofing (or concrete block as in the case of the machine shop and truck service building). Walkways for conveyor galleries were made of precast concrete panels. The modern, attractive air-conditioned office is made of concrete block, and the storage building of prefabricated (Truscon) steel. The machine shop is well equipped with lathes, shapers, drill and radial drill presses, a 10-ton overhead crane, air compressor, etc., and can handle routine repair work. Fluorescent lighting is used throughout the auxiliary buildings.

Operating buildings were designed with ample clearance between machinery and with generous headroom. The structures are well lighted for around-the-clock operation. Conveyor galleries are also well lighted, but windowless, the reason being that windows are too hard to keep clean. Water coolers are located in every major building.

To expedite maintenance and repair, overhead cranes or chain hoists are installed in all departments. Every piece of machinery is accessible via a hoist track, which extends to an outrigger. This permits, as in the case of screens, a complete screen frame to be picked up and replaced rapidly. Outriggers are conveniently located to serve every floor in the screen house and secondary crusher building. The screen house also has a 5-ton freight elevator. A 75-ft., 500-lb. capacity enclosed electric manlift is installed in the primary crusher building.

Also of interest is the intraplant dial telephone system. About 25 dial telephones are distributed throughout the property, and are used for transmitting operating instructions, paging men, etc. All phones can be connected to an outside line through the office switchboard. The telephone system has proved to be very satisfactory for an operation of this kind.

Numerous individuals and firms contributed to making the Presque Isle operation one of the finest in the crushed stone industry. The entire plant, with the exception of the travelling boat loader and dock, was designed and engineered by John F. Meissner Engineers Inc., Chicago. This firm also conducted the initial study to determine the economic feasibility of the project and provided engineering supervision during plant construction and now during initial plant operation. The boat loader was designed by Wellman Engineering Co., Cleveland, Ohio. General contractor for the project was Hunkin-McDowell Co., also of Cleveland; this firm was a joint venture of Hunkin-Conkey Construction Co., and McDowell Co. Building construction began in March, 1953, and operations started 21 months later. Considerable credit in plant design and construction is due three Chemstone officials, including the following: Ralph L. Dickey, president; John V. Andrews, vice-president; and Wm. A. Roberson, chief engineer. Bernard B. Gardner, former superintendent of Kelley Island's Rockport plant was on the Chemstone staff at Presque Isle, and acted in an advisory capacity during construction. He is now connected directly with Presque Isle Corporation. Consulting geologist for the project was Ned W. Andrix, president, Ohio Minerals Resources Co.

Smith-Maynard Co., Bay City, Mich., was the electrical contractor, and Westinghouse electrical equipment was used. Conveyor belting was supplied by Goodyear Tire and Rubber Co., and Link-Belt Co. supplied all the conveyor pulleys, herringbone gear reducers, idlers, and roller bearings.

Officers of Chemstone Corp. are Ralph L. Dickey, president, general manager; John V. Andrews, vice-president; and W. T. Bell, secretary-treasurer.

Officers of Presque Isle Corp. are president, W. W. Hancock; vice-presidents, E. M. Doig, A. S. Gossbrenner, F. J. Laskey, W. A. Morris, Jr., A. F. Peterson; treasurer, W. B. Boyer; and secretary, W. B. Belden.

Chief operating personnel at Presque Isle are N. D. Shafer, general manager; Robert H. Allen, general superintendent; Wm. H. Wright, night superintendent; Thomas W. Connon, quarry foreman; Edward Nowak, night quarry foreman; Harry C. Dewey, mill foreman; John Schuler, night mill foreman; Victor Brousseau, marine loading foreman; Roy Williams, night marine loading foreman; Victor Kryst, maintenance superintendent; Clarence Wade, maintenance foreman; Harold Anderson, assistant maintenance foreman; Byron Lamb, chemist; and Lloyd Chrzan, personnel department. Chester E. Kukulski is resident supervising engineer of John F. Meissner Engineers Inc.

At all-together dinner (speaker's table) of National Industrial Sand Association are left to right: past president J. M. Strouss; vice-president, Emery M. Durstine; Mrs. Clarence R. Wolf; president, Clarence R. Wolf; Mrs. and Mr. William J. Cannon (treasurer); and Mrs. and Mr. V. P. Ahearn

Industrial Sand Producers Discuss Problems Facing the Industry

• National Industrial Sand Association fall meeting at White Sulphur Springs, W. Va., September 21-23. Labor, legislation and percentage depletion are convention topics

MORE THAN 100 MEMBERS and wives, including five past presidents, attended the semi-annual meeting of the National Industrial Sand Association, September 21-23, at White Sulphur Springs, W. Va. This was the largest attendance at any Fall meeting in the history of the association. A board of directors' meeting preceded the general sessions and various committee meetings were held during the three days.

Entertainment included evening get-togethers, a bridge-tea for the ladies, ladies' and men's golf tournaments and an all-together dinner at which president Clarence R. Wolf showed colored motion pictures that he had taken at recent association meetings. First president A. Warsaw who is retiring as head of Wedron Silica Co., Chicago, Ill., was made an honorary life member of the association in recognition of his outstanding service over the years.

Principal topics of the meetings included an address and report on workmen's compensation, an address on labor-management relations, one on taxes with emphasis on percentage depletion, a talk about plant engineering control, a discussion of sand reclamation practices in foundries and various committee reports. The meeting concluded with an unofficial appraisal of the Washington scene by executive secretary V. P. Ahearn. The next annual meeting of the association will be held April 23-27, 1956.

President Clarence R. Wolf, vice-president Emery M. Durstine and treasurer William J. Cannon presided over the three general sessions. President Wolf, in his opening remarks, commented on the excellent attendance and the fact that the association had added five new members during the year. George Thornton, Ottawa Silica Co., Ottawa, Ill., was complimented especially for his efforts in gaining new members. New member companies are Tri State Sand Co., Millville, N. J.; Port Silica Sand Co., Pt. Elizabeth, N. J.; Standard Silica Co., Ottawa, Ill.; Silica Sand Corp., Ottawa, Minn.; and Del Monte Properties Co., Pebble Beach, Calif.

Labor Relations

A general talk on labor-management relations covering developments in collective bargaining, the Wage-Hour Act and guaranteed annual wages was presented by association counsel Charles A. Horsky.

Guaranteed annual wage plans are developing to the point that the industry may have to face up to the problem in dealing with CIO unions, said Mr. Horsky. He pointed out that such plans are not new but that the present movement began in 1943 when the CIO made guaranteed annual wages one of its long range goals. An attempt to gain that objective from big steel in 1944 was rejected by the N.L.R.B. on the grounds that the feasibility of such a plan could not be determined. However, it was recommended that a study of plans already in operation be made.

The Ford and General Motors plans concluded this year and followed more recently by American Can Co. and Continental Can Co. are fore-runners of more to come. A trust fund is established in each case. General Motors will start payments June 1, 1956, based on several assumptions. One condition is that the Bureau of Internal Revenue will rule that amounts paid into the fund are to be considered business expenses. The labor department must rule that amounts paid under the program are not part of the "regular pay" on which overtime compensation is computed. A third condition is that States wherein at least two-thirds of the workers reside must rule that there will be no interference with the payment of unemployment compensation where companies supplement such payments.

General Motors pays five cents per hr. into the fund for each worker and there is a ceiling of $400 per worker. The ceiling is $393 in the Ford plan and $185 for the can companies which have more stabilized employment. The amount of the fund may be reduced if average payments under the plan go down.

Plans like these, said Mr. Horsky, are a great incentive for companies to get the States to step up their unemployment compensation. In the GM plan, benefits are geared to 65 percent of the average weekly straight time earnings over a period of four weeks and 60 percent for the next 22 weeks, the difference coming from state unemployment compensation. It applies for lay-offs only and not where lay-offs are due to accidents or strikes.

Single men benefit more than family men, and there is question whether labor mobility is discouraged and whether new employers would be discouraged said Mr. Horsky in his analysis of weaknesses.

It was suggested that producers consider their lay-off records and compile statistics on their employes in event such demands might be made in bargaining.

The only real amendment to the wage-hour law has been the $1 minimum wage but, cautioned Mr. Horsky, the pitfall concerns exemptions. The fact that individuals are salaried or executives does not necessarily exclude them from coverage but, rather, the specific definition of their jobs governs. As far as group bargaining is concerned, he confirmed that it is now alright for a group of companies to regard a strike against one member as a strike against the group.

Percentage Depletion

Tax counsel John T. Sapienza brought the membership up-to-date on percentage depletion. In the absence of the expected proposed new regulations, he said, companies must proceed with the old regulations as far as they apply. The 15 percent depletion bill is pending in the House Ways and Means committee.

As to aggregation of mineral interests for purpose of computation of depletion, he said that a producer must elect to aggregate or not for the first year after December 31, 1953, but will have three months after the new regulation is issued to reconsider his election to aggregate or not and file an amended tax return.

Should it be decided to fight the revenue department, in percentage depletion matters, he believes that industry will fare better with district courts of claims than the tax courts and, where necessary, deficiencies may be paid and efforts be made to gain refunds later.

In the Cherokee brick case where the courts held that all processes were permissible in arriving at gross income, Mr. Sapienza said that the revenue department will not follow the precedent. In the subsequent Hitchcock talc case, the court permitted income from both talc crayons and powdered talc whereas the revenue department had separated the two for the purpose of computing income, and the court permitted inclusion of boxes and bags which had been excluded by the treasury department. This case is to be repealed by the revenue department.

Test cases now in the courts will have bearing where refunds are sought and there are now three cases in the courts of which two concern limestone and the end use test.

The treasury department has held that sand and gravel producers dredging the navigable waters under federal permit have no economic interest in the deposits and therefore are not entitled to percentage depletion. However, such producers are considered to have an economic interest if they have a non-revocable right to the deposit and provided the material does not replenish itself.

Mr. Sapienza said that there was no one pattern applying over the country and that revenue agents all have their own interpretation. Should a company have a bad agent, its recourse is to have good counsel. The wide differences in interpretations are blamed on the decentralization program of the revenue department and might possibly result in federal review again in cases involving more than $5000.

Following Mr. Sapienza's talk, members were asked to comment on their practices in the filing of returns. The majority filed for 5 percent percentage depletion in 1951, 1952 and 1953 and for 15 percent in their 1954 returns. A few filed for 5 percent in 1954 and are filing for refund. Many of the returns have not yet been checked for approval.

Workmen's Compensation

Paul E. Gurske, Director, Bureau of Labor Standards, U. S. Department of Labor, discussed the objectives of workmen's compensation, the weaknesses of present laws and the federal program to help the States strengthen their laws.

When the compensation laws were proposed, it was thought that benefits should be based upon two-thirds of the average weekly wage of the worker but they have fallen far short of that in recent years as wage rates and living costs rose sharply. The average is about 40 percent now and lower yet in some states. Other weaknesses pointed out are that 12 million workers are not protected by workmen's compensation and in many states there is limited and inadequate coverage of occupational diseases.

Because of such deficiencies, the Department has been working on development of a new model workmen's compensation act, based on bringing together the best experience in each state into a single comprehensive code. Its purpose is to assist and guide the States to improving their laws and, in this regard, Mr. Gurske emphasized that the department believes that workmen's compensation should remain as the responsiblity of the separate States. The model code would set up objectives for guidance.

Underlying the objectives is the philosophy that it is the purpose of a good workmen's compensation system to provide an injured worker with the best possible medical care and necessary rehabilitation service. Also, the desire is to provide adequate benefits during the period of disability to protect the worker and his family.

Among specific standards drawn are broad compulsary coverage of employers with one or more employes, including agricultural workers. A second objective is full coverage of occupational diseases, recognizing that occupational disease is encountered in almost every occupation. Today, almost half the States limit coverage to specific diseases only.

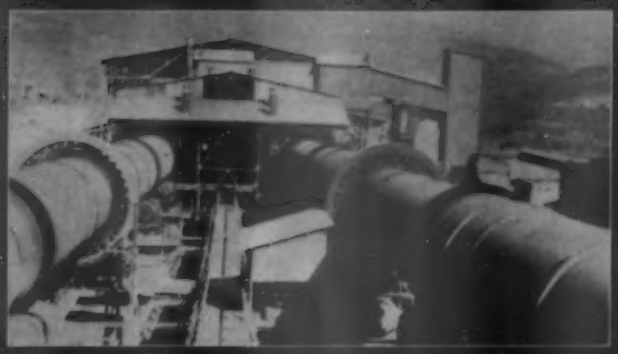
A third objective is that an injured worker be entitled to receive two-thirds of his average weekly wages when he is disabled by a work accident, requiring that each state raise its maximum benefits payable to meet that goal. Where a permanent total disability occurs, benefits would be paid for life and if a worker is temporarily but totally disabled he would be paid throughout the period of disability. If a worker be killed, benefits would be paid his widow until her death or re-marriage, and to his children until they reach 18, and beyond if they are physically or mentally incapacitated.

An injured worker is entitled to unlimited medical care including any services and treatment required to restore him to the maximum level of physical capacity.

A fifth objective deals with second injury funds in order to facilitate the getting of jobs by handicapped workers. Under the plan, the State would provide for the payment of the difference between the benefits payable for a permanent partial and those payable for a permanent total disability. Thus

(Continued on page 106)

CEMENT



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Use Time Recorders to Check Operation of Equipment

By ANDREW L. FORRESTER

Fig. 1: Recorder with stylus and wax chart

"TIME IS MONEY" is an old saying that applies very well to rock products plant operations. The use of special time recorders is even more important in this industry than in other branches of heavy industry. Recording instruments for draft, pressure, temperature, C_xO and for other process variables, as for example in the cement industry, base the record graphs on time. Usually a recording chart of an instrument has the horizontal divisions based on time (minutes, or hours), and the vertical lines denote the actual values of the measured process factor. Chart records of this kind allow plant management to note down time of machinery usually at a glance. For example, kiln temperature will vary from working temperature. Any interruption of normal plant operation can be seen in one way or another on record graphs from usual instrumentation.

Where circumstances warrant, however, it may be beneficial to use special multi-pen time recorders to show on a circular chart, or on a roll chart the times of actual operation of several machines, which latter are supposed to operate in coordination. The advantage is that the plant supervisor can see at once where a jam has occurred due to sudden stoppage of a single piece of machinery. To be able to watch the running time or event occurrence on a single-multi-pen recorder is a great asset in a plant where equipment may be dispersed over a wide area. The sudden stoppage of a conveyor remotely located from a kiln can be seen at a glance on a multipoint running time recorder chart, and steps can be taken from a central control point at once to avoid jamming the operation.

In the rock products industry, a number of machines are used which ordinarily are not equipped with record producing instruments. In addition to conveyors, elevators, crushers, ball mills and other equipment are being run without recording operation time. Briefly, the advantages of these recorders and centralized control are as follows: supervision of causes of down time, immediate counter-action to jamming, possibility of evaluating co-ordinated operation.

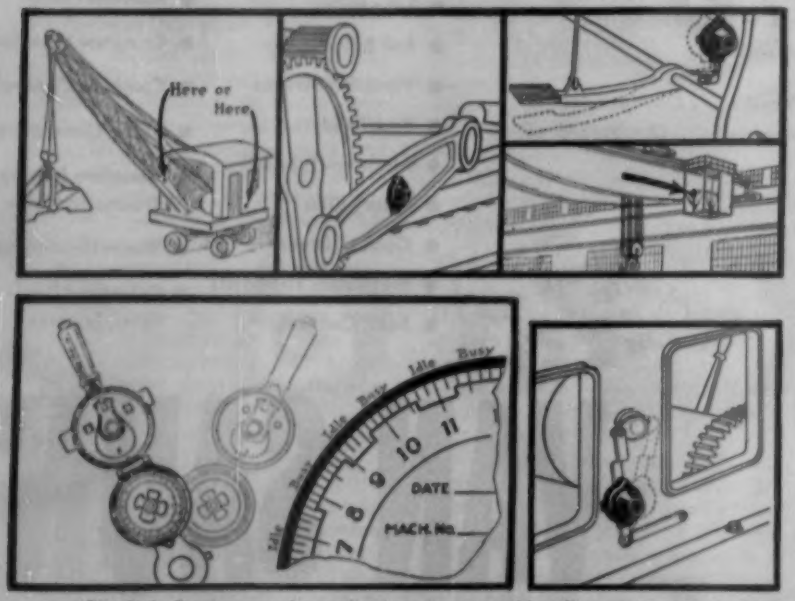

Fig. 1-A: Service recorder applications in material handling equipment

Types of Time Recorders

Three types of event or operation recorders are available from American instrument makers. One group is self-actuated and works on vibrations caused by a moving machine part, or operates if a machine part moves in a swinging movement, or if it rotates. A second group is also self-contained, and operates on motion caused by a moving lever, a cam, a pulley, or any other machine element which moves the instrument lever when the supervised plant equipment is in operation. A third group requires an outside source of power for its operation, which is usually electric current, but can also be compressed air or a liquid under pressure. Either circular or strip chart recorders are available from several prominent instrument makers. In some types strip or roll charts may last for as long as a month before they require to be changed. Speed of movement of the strip chart can be arranged to suit the operation to be recorded. Similarly, one rotation of a circular chart may occupy one hour, 4 hr., 12 hr., or 20 hr. On one instrument a circular chart can be used for seven days, the record being made in a spiral form on waxed paper by a stylus.

In mechanical instruments the motion of the recording pen is derived from the movement of the machine part, such as a lever or a rotating shaft. Electrically operating instruments usually incorporate contacts (micro-switches etc.) for making or breaking a circuit to energize or de-energize a small solenoid, the core of which is attached to the recorder pen. Single- or multi-pen instruments are available from specialized firms, and the latter will produce up to 36 records simultaneously on a single strip chart.

A multi-pen record not only presents information on each operation and its duration, but also indicates the

IN THIS ARTICLE

. . . the author suggests many applications of recorders now being used and some not yet tried which may be applied to advantage in the rock products industries to check operations and correct conditions brought about by temporary stoppage of equipment in processing a product. The instruments serve as a means of cutting costs and improving quality of the product being processed.

relation of one operation to others and thus gives a co-ordinated picture of happenings. In the following brief survey, the design and operation of a few typical operations — or event recorders — are described.

Self-Actuated Recorders

Various instrument makers produce self-actuated types to be simply fitted to a moving part of material handling equipment, such as shown in Fig. 1. These instruments are self-actuated and require no outside source of power for their operation. They are extensively employed on motor cars and commercial vehicles, to record the periods during which the vehicles are in motion. In recent years they have also found many applications in industry, and especially in mechanical handling operations, because they can be readily fitted on any moving part, as seen in Fig. 1A. The instrument is small and sturdy, and it is only necessary to insure, when it is applied to a rotating part, that the speed of rotation is not too great. The recorder may also be mounted on a machine control lever to provide a "position" record. When the lever is in an idle position, a thick line is produced on the chart, or, alternatively, operating periods with the lever in the "on" position can be indicated by a thin line. Operation of the Servis recorder depends on gravity. A small clockwork movement rotates a paper disc within a locked case, and a balanced pendulum swings when the machine is running, and marks the wax paper by means of a stylus. Daily or hourly records can thus be obtained. For mechanical handling equipment, another type is used, covering a period of seven days, the record being produced in the form of a gradual spiral, performed by the stylus. The line is broad when the moving machine part produces oscillations or vibrations, so that the stylus moves, but is fine when it is at rest.

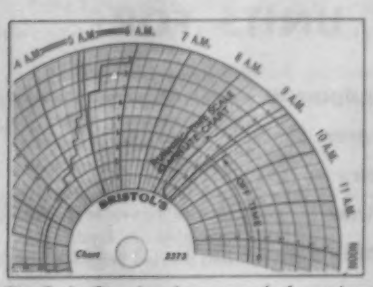

Fig. 2-A: Circular chart record of running time of equipment

Running Time Recorders

Various makes of circular chart type recorders are available, actuated from a lever arm movement. The lever arm is moved from a cam fixed on a rotating shaft, or can be actuated from an oscillating machine part by means of a suitable transmission gear. As an example, the drive may be provided by a lever type linkage or sprocket. (Fig. 2).

A typical mechanical operation recorder is the "Bristol's Running Time" recorder. It will indicate operation and idle time, expressed in hours, minutes, or seconds, for a given period. The running time readings are suitably magnified so that the total operating time can be readily ascertained. The instrument is electrically operated by means of two synchronous motors, and the range may be either 10 min., or 60 min. The chart motor and the running time motor can be driven from the plant's normal electricity supply.

Electrical contacts may be of various types to suit the machine or other equipment on which they are to be installed. For example, micro-switches, limit switches, tilting mercury switches, current sensitive relays, or photo-electric or electronic relays can be used.

Event Recorders

Various types of instruments have been developed for recording physical quantities which are capable of being translated into electrical quantities; such as, running, idle and slowing down times of machines and their speeds. Multi-pen instruments produce a number of records on a single chart. One type of six-pen instrument gives six simultaneous records in different colors on a single chart, which covers a period of 8, 14 or 30 days. Multi-pen instruments having up to 36 pens working on a roll chart are available. The pens are raised and lowered by

Fig. 2: Running time recorder with circular chart

means of solenoids, and electric current impulses cause the pens to register at certain periods of time. The coil can be energized from a suitable point in the mechanical handling plant by means of a contact switch at the point of supervision. Multi-pen operation recorders are made in various types; for wall mounting, for fixing on a desk in the engineer's office, or in portable form. Special instruments are also available, producing several records on a single chart; for example, volts, kilowatts, and records of the power consumption of a group of several motor-driven pumps, together with times of operation of each pump, (Fig. 3). Similarly, the power consumption of driving motors of several conveyor belts together with periods of time during which each conveyor is in use can be recorded on a single roll chart in different colors.

Recording Counting

A sub-group of electrically operated instruments, called recording counters or chronographs, are employed when events in a mechanical handling plant can be arranged to cause the making or breaking of an electric circuit. For

Fig. 3: Multi-purpose operation recorder with case open

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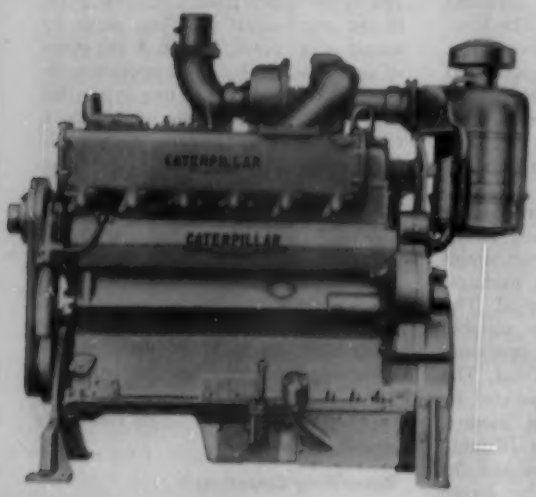

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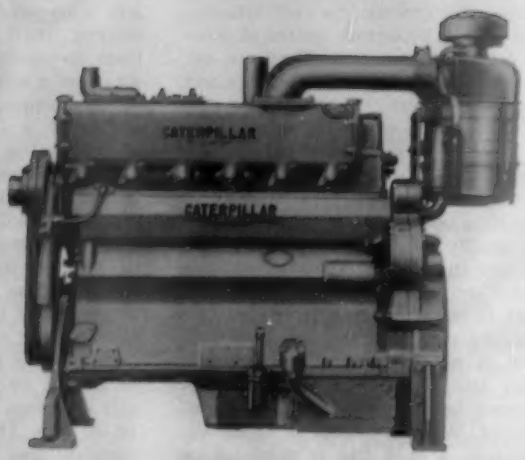

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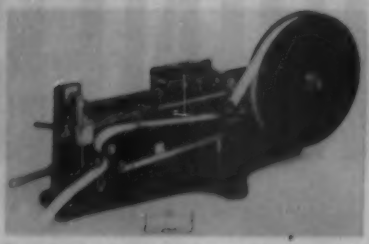

Fig. 4: A chronograph recording instrument

example, Cambridge chronographs can be used as illustrated in Fig. 4 for obtaining one to three records on a band of paper, 25 cm. wide by 167 meters long. One pen may be connected to a time-marking mechanism to provide a time scale, while the other two pens record the events under observation. These instruments can be applied for recording very short intervals of time, if required.

Alarm Tachometers

It is sometimes advisable to give the plant operator an audible warning if transportation speed exceeds a certain safe limit. The use of an electric tachometer (Fig. 5) with sender driven from a shaft, and receiver equipped with a maximum contact on its dial will produce the desired alarm. Alternatively, where it is desired to have records available, of certain maximum speeds of plant handling movements, the dial contact can be wired to one of the electrical event recorder types mentioned before, and will produce a graph showing times and duration of maximum speeds.

Practical Applications

Space does not permit to go deeper into the very numerous possibilities for applying event or operation recorders in mechanical handling operations, but the practical engineer or supervisor dealing with such plants will easily find out where record charts would give him valuable information. For example, the quantity of material coming off a conveyor line can be recorded by applying an electric eye with relay, producing electric timing impulses wired to an event recorder. The number of motors in operation at the same time can be recorded, or the shunting operations in a railway yard, (Fig. 6) the use of cranes, elevators, and hoists. By fitting microswitches to moving parts: such as beneath idler rollers of a belt conveyor, the load distribution can be supervised. Opening times of doors, of bunker outlets, etc., can be recorded, operation of winding machines, of loading equipment, and of many other types of mechanical handling can thus be closely supervised. The use of operation recorders on charges of continuous kilns, industrial ovens, or on drivers to ascertain whether they are being regularly fed is another important use.

Fig. 5: Electric tachometer, generator-driven from belt conveyor

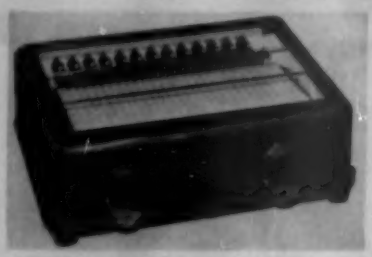

Fig. 6: Twenty-pen operation recorder for checking operations of cranes, elevators, hoists and railway yard shunting

Frequency of types of automatic weighing machines can be recorded, thus serving as a check on the regularity of work. Quarries using widely dispersed mechanical equipment can thus be efficiently supervised with these weighing machines.

In conclusion, it is strongly recommended that in all instances where a jam occurs from time to time, instruments should be installed. Frequent analysis of the records will give a useful indication where time has been unnecessarily wasted in the plant operations.

ROCKY'S NOTES

(Continued from page 51)

er points made is the statement that β-C_2S is stabilized to some extent by an excess of CaO and that in this case the Ca^{2+} and O^{2-} ions must be interstitially placed in the holes. On the other hand excess SiO_2 does not enter the lattice. There will always be present small amounts of uncombined CaO and silicates more acid than C_2S. The latter do not enter the lattice forming C_2S, but the CaO does.

Evidently this means that the hydration of C_2S is the result of the uncombined CaO in the holes of the lattice structure of C_2S, but there being less of it than in the C_2S lattice structure, the hydration reactivity is necessarily slower and less complete; and the unreacted SiO_2 or the acid silicates (more acid than C_2S) remain as such to supply reactive SiO_2 to the hydrated cement, with which the free hydrated lime subsequently combines. In other words, if our interpretation is right, a cement high in dicalcium silicate supplies its own pozzolan to the hydrated cement.

In discussing the setting properties of C_2S, Dr. Nurse said: "It has been suggested that the special feature of the structures of cement minerals leading to hydration reactions is the existence of 'holes,' or irregular one-sided coordination of Ca atoms. Since some types of solid solution will tend to increase this irregularity of structure, it might be expected that specimens of β-C_2S containing different stabilizers would have different setting properties."

One of those discussing the paper objected to the term "holes" in the structure of C_2S. Dr. Nurse replied: "It is perhaps incorrect to refer to 'holes' in so dense a structure as β-C_2S, although the conventional crystal model in which the ion is represented as a solid ball can be equally misleading. The factor which seems to be common to cement minerals which hydrate readily is that the coordination of the calcium ions is high and is irregular, so that a fractured surface of a crystal will contain areas of varying concentration of electrostatic charge, which may well be the points at which hydration begins."

We believe a very free translation of this statement is, that when a grain of clinker is broken, its surface will contain some calcium ions with distorted O coordination, or to put it another way, a distorted *lime* structure, which because of its distortion is particularly reactive to water. The hydration of this surface- exposed lime fractures some of the remaining clinker particle and opens up new surfaces of distorted lime structure to continued hydration.

More to Come

This article is intended to be only the first of a series to come in which we shall review and comment on some of the other subjects covered in the symposium. We shall try to confine our remarks to suggestive material of which even the uninitiated can see the significance. For example, from the paragraphs that have preceded, it should be clear that very small amounts of "impurities"—alumina, iron oxide, alkalies, etc., must have a pronounced effect on the lattice structures and properties of the calicum silicates. The time is probably now here to study how these impurities can be utilized to *improve* cement, since it is obvious in commercial production of portland cement they can never be eliminated, even were it desirable.

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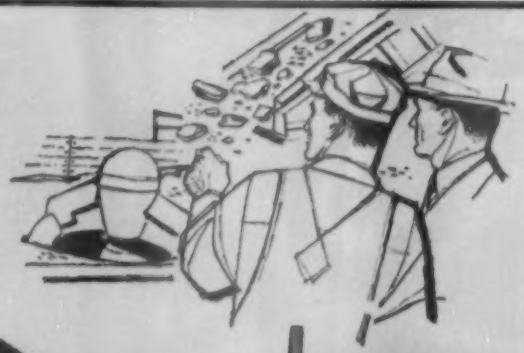

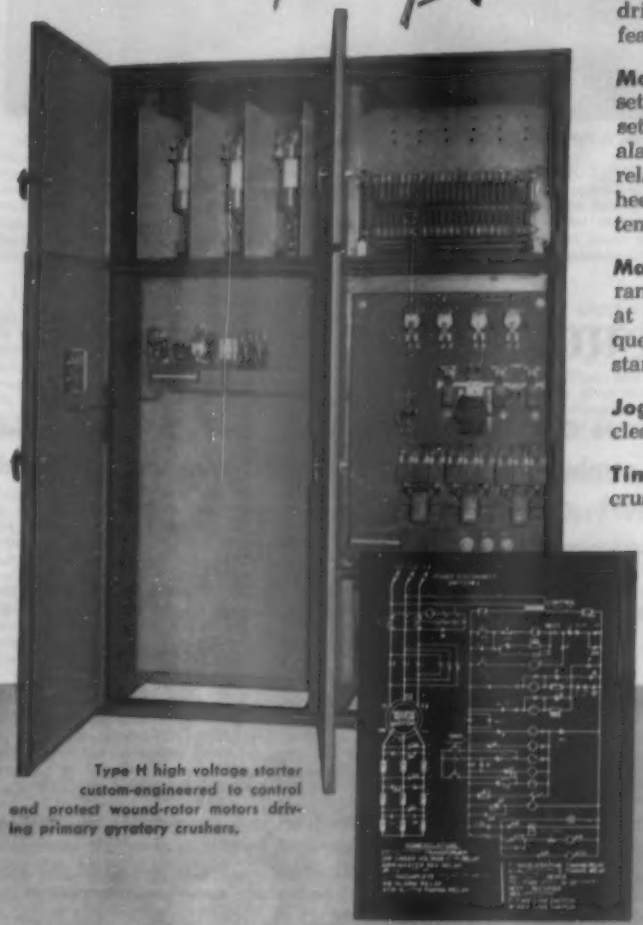

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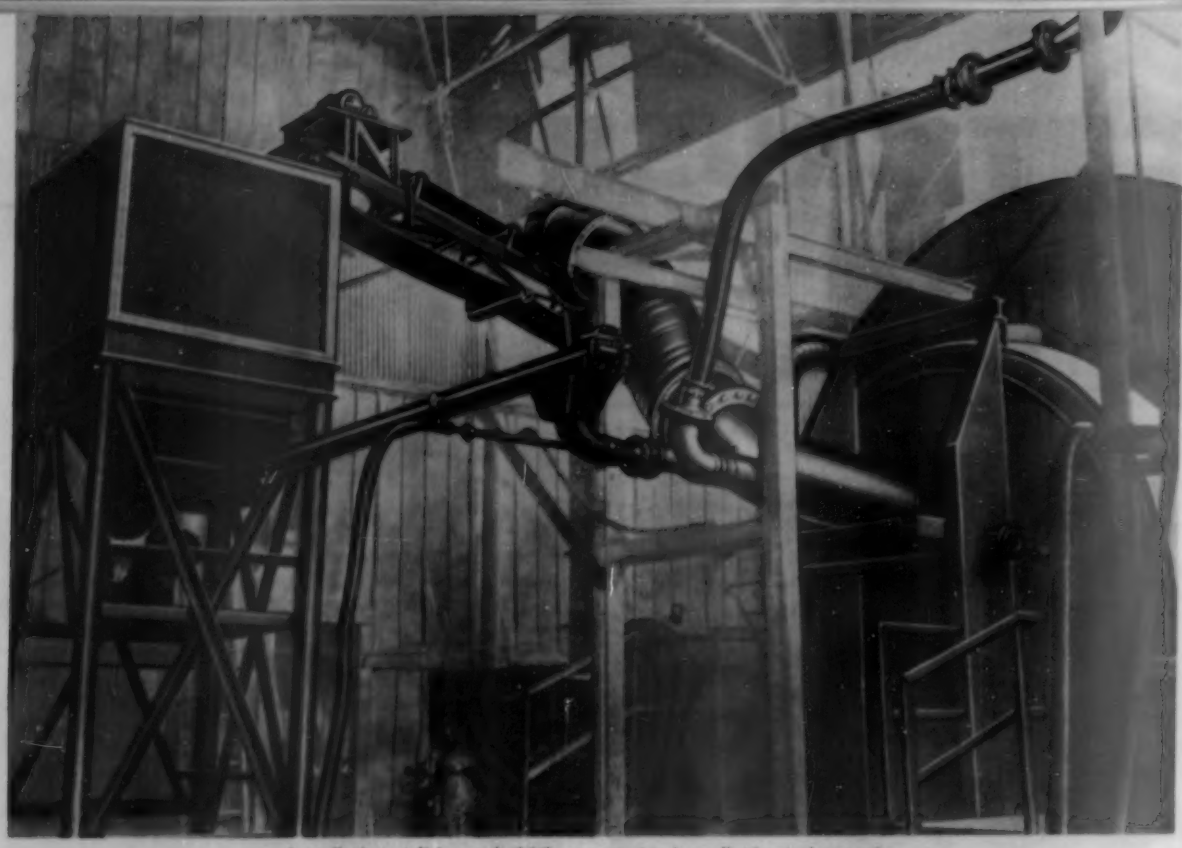

Installation at firing end of kiln arranged to burn fluid petroleum coke

FIRING KILNS With Fluid Petroleum Coke

• Permanente Cement Co., Permanente, Calif., has completed successful combustion tests of pulverized petroleum coke used as a kiln fuel

By R. M. CORNFORTH AND E. R. LEE, JR.*

WITH THE ASSISTANCE OF PERMANENTE CEMENT CO., Kaiser Engineers has studied the application of fluid coke as an industrial fuel. The first cycle of this investigative program was completed when full scale combustion tests were conducted in rotary kiln operations at the Permanente, Calif., plant of the Permanente Cement Co.

A 50-ton sample of fluid coke was obtained in March of this year for test purposes from the Carter Oil Co.'s new coking unit at Billings, Mont. This coke was shipped from Billings to Permanente in a closed railroad hopper car of the type used to transport bulk cement. The car was spotted and unloaded over a conventional track hopper. An open dump truck moved the material to the test site.

The analysis of this sample as received is as follows:

Screen Analysis

Screen Size	Cumulative Percent Retained
8	5.2
35	11.1
65	48.6
100	83.1
200	93.8

At Permanente, there are five rotary kilns which are among the largest in the cement industry. These 12- x 450-ft. kilns are inclined at ½-in. per foot. Average speed of rotation is 57 r.p.h.; clinker capacity 4000 bbl. per day.

These kilns are normally fired with natural gas purchased from the local utility at an average of 948,000 cu. ft. per hr. During the one or two extremely cold months each year, Bunker C fuel oil is used. Fuel is admitted to the kiln by a burner which extends 8 ft. into the discharge end of the kiln. The burning zone begins approximately 15 ft. from the hood and is about 50 ft. long. Primary air for combustion is provided by 75-hp. fans. Combustion zone temperature reaches 2900 deg. F. The back end temperature of the kiln is approximately 700 deg. F.

Composition

	Weight Percent
Carbon	89.1
Sulfur	6.0
Volatile (1742 deg. F.)	3.8
Ash	0.16
Vanadium	0.03
Nickel	0.01
Net Heating Value B.t.u./lb.	14,300

*Kaiser Engineers, Division of Henry J. Kaiser Co., Oakland, Calif.

(Continued on page 103)

INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 **ARC WELDING** — Hobart Trade School, Inc., has prepared a 200-page book comprising the second part of a text book entitled "Modern Arc Welding." The book contains the complete series of 40 arc welding exercises as used at the Hobart Trade School. It is available with descriptive pictures, charts and diagrams, at a cost of $1 per copy from the school at Hobart Square, Troy, Ohio.

2 **BEARING PRESSURE GREASE** — The Alpha Molykote Corp. has issued Bulletin 101, describing Molykote, Type BR2, a general purpose grease with extreme bearing pressure properties. Physical specifications are given in detail, as well as test results.

3 **BOILER PLANT INSTRUMENTATION** —The Hays Corp. has published a catalog, No. 55-605-83, giving data on the line of power plant instruments and control systems. Photos and schematic drawings of combustion guides; draft gages; flow, level temperature and pressure instruments; combustion control systems; and panels are given.

4 **CELLULAR CONCRETE** — Mearl Manufacturing Corp. has issued a brochure on the Mearlcrete System for making cellular concrete. It illustrates, with charts and photographs, the advantages of cellular concrete, and typical installations using foam concrete are also shown.

5 **CENTRIFUGAL PUMPS**—Ingersoll-Rand Co., Cameron Pump Division, has published Form 7223-A, describing and illustrating its line of general purpose centrifugal pumps, CRV cradle-mounted type. Included are line drawings, cross-sectional views, performance data, design modifications, dimensions, discharge positions, and typical installations.

6 **CLAMSHELL BUCKETS**—Blaw-Knox Co. has issued Bulletin 2378-R, a 24-page catalog on two, three and four line clamshell buckets, classified for the cement, chemical and fertilizer industries. Included are line drawings, photographs and classified tables of 60 different buckets giving weight, dimensional and capacity data, as well as a listing of plants in which the buckets are in use.

7 **COMPRESSION TESTING MACHINES**—Forney's Inc. has brought out three bulletins; on the Model QC-100-S compression and flexure testing machine for concrete cylinders, cubes, block and brick; on the Model QC-200 tester for concrete block and concrete cylinders; and on the Model LT-500 compression and flexure testing machine for concrete cylinders, cubes, block, beams and lintels, and compression and modulus of brick. Dimensions and weights, accessories, conversion charts, construction, etc. are given.

8 **CONCRETE TESTER**—Soiltest Inc. has brought out Bulletin CT-711, describing and illustrating the Model CT-711 portable concrete testing machine for testing cubes, cylinders and beams. Attachment accessories are listed, and application data is given.

9 **CONSTRUCTION EQUIPMENT RENTAL** —Associated Equipment Distributors has published the "Seventh Edition Compilation of Rental Rates for Construction Equipment." The book is a compilation of average rental rates charged by distributors, as reflected by a nation-wide survey. The book is available from the Associated Equipment Distributors at 30 East Cedar St., Chicago 11, Ill., at a cost of $5 per copy.

10 **CONVEYORS**—Diamond Iron Works, Division of Goodman Manufacturing Co., has released Bulletin D-5416, describing and illustrating portable and stationary conveyors. Included are specifications, dimensions, line drawings, and typical application photographs.

11 **CRAWLER TRACTOR** — Allis-Chalmers Manufacturing Co., Tractor Group, Construction Machinery Division, has brought out Bulletin MS-662, giving the technical and operating story of the HD-16 crawler tractor. A pictorial review of the design, engineering, and operating advancements are given, along with specifications and available matched attachments and accessories.

12 **DIAPHRAGM CONTROL VALVES**—Minneapolis-Honeywell Regulator Co., Industrial Div., has issued Specification Sheet 439, covering the "Series 400" diaphragm control valves. Actuator and body specifications, flow characteristics and complete dimensions for the double-seated, single-seated and three-way types are included.

13 **DIESEL ENGINES** — Caterpillar Tractor Co. has announced Form 31554, describing and illustrating the D342 and D339 diesel engines, giving an explanation of the machining and research going into the manufacture of the engine. Typical application photographs and specifications are given.

14 **DIESEL POWER**—Cummins Engine Co., Inc., has issued a 40-page, pocket-size booklet entitled "Cummins Who's Who, as a directory of original manufacturers who offer Cummins Diesels as standard or optional power. It contains the name and address of the manufacturer, plus a listing of his equipment, and the corresponding diesel used for its power.

15 **DUMP BODIES, TRUCKS**—Hercules Steel Products Co. has published Catalog 325, describing its complete line of dump bodies, hydraulic hoists, trailer dumps, hydraulic Load-N-Gates and special truck equipment. Models, capacities and recommended applications are listed.

16 **ELECTRONIC CONTROLS**—Eaton Manufacturing Co., Dynamatic Division, has published a bulletin, No. EC-1, illustrating and describing Dynamatic electronic controls. Complete with illustrations and circuit diagrams, the 16-page bulletin gives non-technical data on the installation, performance and maintenance of the basic electronic control.

17 **FLEXIBLE METAL HOSE**—Atlantic Metal Hose Co., Inc. has released Bulletin 20-E on corrugated flexible metal hose of annular and helical construction. Steel and bronze hose, with and without wire braid, couplings and assemblies are described, and complete engineering data inclusive of bending radii, bursting pressures, weights, etc. is included. Applications are also listed.

18 **FLOTATION**—Denver Equipment Co. has released Bulletin F12-B9, describing and illustrating the "Sub-A" Unit Flotation Cell for recovering coarse materials. Applications are shown, and construction and operation are explained with photographs, drawings and data.

19 **FORK LIFT TRUCKS**—Towmotor Corp. has published the first of a series of "fact folders," giving data on the 500 Series fork lift truck, including features, specifications, schematic drawings, performance data, and tables and diagrams giving lift, height and weight details.

20 **FRICTION MATERIALS** — Caterpillar Tractor Co. has brought out Form DE548, entitled "Friction Facts," describing the clutch facings and brake linings in its machines and the methods used to insure long-life. A question-and-answer method is used in explaining the testing and research program, and illustrations point out how the rugged conditions on the job are duplicated in the tests.

21 **HYDRAULIC BOOMS** — Ingersoll-Rand Co. has issued Form 4162, covering the line of Hydra-Boom hydraulic booms for use in the construction and mining industry. Dimensioned coverage diagrams, information on special Jumbo mountings, and applications and advantages are included.

22 **INDUSTRIAL TRUCKS**—The White Motor Co. has announced a booklet entitled "Facts About White Six-Wheelers For The Construction Industry," giving background information concerning engines, frames and axles for both on and off the road service in various construction operations. Typical applications of specialized design six-wheelers are also illustrated.

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23 **INDUSTRIAL CRAWLER TRACTOR** — The Oliver Corp. has issued Form A-1041, describing and illustrating the Model OC-3 crawler tractor. Typical application photographs, advantages and features, construction details, maintenance data, allied equipment and specifications are included.

24 **INSTRUMENTATION LITERATURE** — Minneapolis-Honeywell Regulator Co., Industrial Division, has announced Bulletin 100-D, an index of Industrial Division literature. The index is broken down by subject, industry, and product, and covers catalogs, bulletins, specification sheets, data sheets and articles from "Instrumentation Magazine."

25 **LABORATORY EQUIPMENT** — Denver Equipment Co. has announced Catalog LG2-B10, describing over 146 different items for laboratory and pilot plant testing. Drawings, photos, and charts are included, and a section discusses minerals and their characteristics. Construction, capacities, horsepower requirements and operational features are given for each piece of equipment.

26 **LEVEL INDICATOR** — The Bin-Dicator Co. has brought out a bulletin describing and illustrating the "Roto-Bin-Dicator," a bulk material level indicator for installations requiring a non-diaphragm type unit. Included are advantages, outline dimensions, mounting instructions and a schematic circuit diagram.

27 **LIGHTWEIGHT CONCRETE SLAB SYSTEM**—Rapidex Corp. has announced a revised eight-page catalog containing application photographs and data on Rapidex lightweight concrete sectional slab system for floors and roofs. Uses, advantages, and illustrations showing manufacturing process, assembly and installation of the system are given, as well as load design tables and noise reduction and heat transmission coefficients.

28 **LOADER**—N. P. Nelson Iron Works, Inc. has brought out literature describing and illustrating the Nelson B-69 loader which has a loading average of slightly over 2000 tons of material per working day. Designed for loading up to 10 t.p.h., the loader features full hydraulic controls. Specifications and typical application photographs are given.

29 **LUBRICATION**—The Texas Co. has published Vol. XLI No. 9 of "Lubrication," on the handling of lubricants. Photographs are used throughout.

30 **LUBRICANTS**—The Alpha Molykote Corp. has issued Bulletin 103A, describing the line of Molykote lubricants, including five recently added lubricants. A selector chart describes the type, kind of carrier used, the temperature range in which it operates best, and the proper method of application. Diagrams, and features are included.

31 **MAGNETIC DRUMS**—The Homer Manufacturing Co., Inc. has issued Bulletin MD-200, describing permanent magnetic drum applications and features, for use in processing grains, chemicals, minerals, sand, cement, slag, etc. Diagrams, performance data, application guides and pictures and descriptions of the drums are included.

32 **MAINTENANCE OF CLAMSHELL BUCKETS**—Blaw-Knox Co. has published Bulletin 2373-R, a 40-page booklet giving data on the maintenance and care of clamshell buckets. Included are a list of common abuses leading to early bucket failure, and proper lubrication practices, welding procedures, the use of counterweights for maximum efficiency, etc.

33 **MINERAL JIGS**—Denver Equipment Co. has issued Bulletin JG-B1, giving data on its selective mineral jigs designed to handle unclassified unsized feed. Drawings, specifications and dimensions are included, and low water requirements precision separation, horsepower requirements, etc. are discussed.

34 **MOTOR CONDITIONER**—Revere Chemical Corp. has announced Bulletin LL-1649, describing Monolube motor conditioner, outlining methods for effective use in the combustion chamber, crankcase and gasoline tank. Also described is the chemical action by which Monolube is said to clean, lubricate and repower internal combustion engines.

35 **MOTOR SCRAPER**—Allis-Chalmers Manufacturing Co. has issued Catalog MS-663, giving engineering, design, construction and mechanical features of the TS-360 motor scraper. Photographs and drawings are included, as well as operator comforts and complete specifications.

36 **PAN FEEDERS**—Stephens-Adamson Manufacturing Co. has prepared the "Amsco" Manganese Steel Pan Feeder bulletin, describing and illustrating the feeders in various applications. Performance records, capacities, chain tensions, and horsepower required are given, as well as other features.

37 **PYROMETER**—Electronics Corporation of America, Photoswitch Division, has brought out Bulletin PT 556, containing descriptive data, specifications and dimensions on photoelectric pyrometer Type P2T, for measurement and automatic control of high temperatures.

38 **QUARRY PRODUCTION** — Caterpillar Tractor Co. has issued Form DE558, entitled "Profit Producers in Pit and Quarry," describing the use of diesel engines, track-type tractors, bulldozers, wheel-type tractors, scrapers and wagons in quarry operation. Typical application photographs and case histories are included.

39 **REACH FORK TRUCK**— The Raymond Corp. has issued Bulletin 841, describing the features of two electric Reach Fork trucks. Typical application photographs and complete specifications are given.

40 **SHOVEL** — Bucyrus-Erie Co. has released Bulletin 71-B-1, describing and illustrating the 71-B shovel of 3-cu. yd. capacity. A list of general specifications is given, and advantages are described.

41 **STRIP-CHART RECORDERS**—The Bristol Co. has released a 12-page bulletin describing the line of 6-in. strip-chart recorders for pressure, liquid level, temperature, flow and mechanical motion. Installation drawings, photographs of the various models and their features, and the use of the recorder as a receiver for remotely generated signals, either pneumatic or electrical are included.

42 **TRACK PARTS**—Caterpillar Tractor Co. has released Form DE586, entitled "How to Be Sure About Track Parts." Starting with a chemical analysis of every mill heat of steel, the path of inspection and testing behind every track part is traced.

43 **TRACTOR HARDSURFACING** — Rankin Manufacturing Co. has published Form A-7, a cutaway template that can be used in measuring the wear of Caterpillar tractor rails, sprockets, idlers, grousers, and rollers. Also available is Form A6-1, a reference chart giving exact specifications for Caterpillar, International, and Allis-Chalmers tractor rollers and idlers, and also shows how to apply Ranite hardsurfacing to tractor shovel parts.

44 **TRAILER DUMPS**—Galion Allsteel Body Co. has prepared a six-page catalog, No. LL-1234, describing and illustrating the complete line of Transporter, Excavator and Hitchhiker trailer dumps. Detailed specifications are given for each model, covering body capacities, hoists, chassis details, axle ratings, construction details, etc.

45 **V-BELT DRIVES** — Allis-Chalmers Manufacturing Co. has published Tex-Book 20P40, a 74-page booklet of multi-color tables for selection of constant speed "Texrope" V-belt drives. Data on design features, basic drive principles, and technical data on sheaves are included.

46 **VIBRATING SCREENS** — Link-Belt Co. has released Book 2354, describing and illustrating its CA concentric action vibrating screens. Included are a capacity chart, selection data, engineering drawings, specifications and typical application photos.

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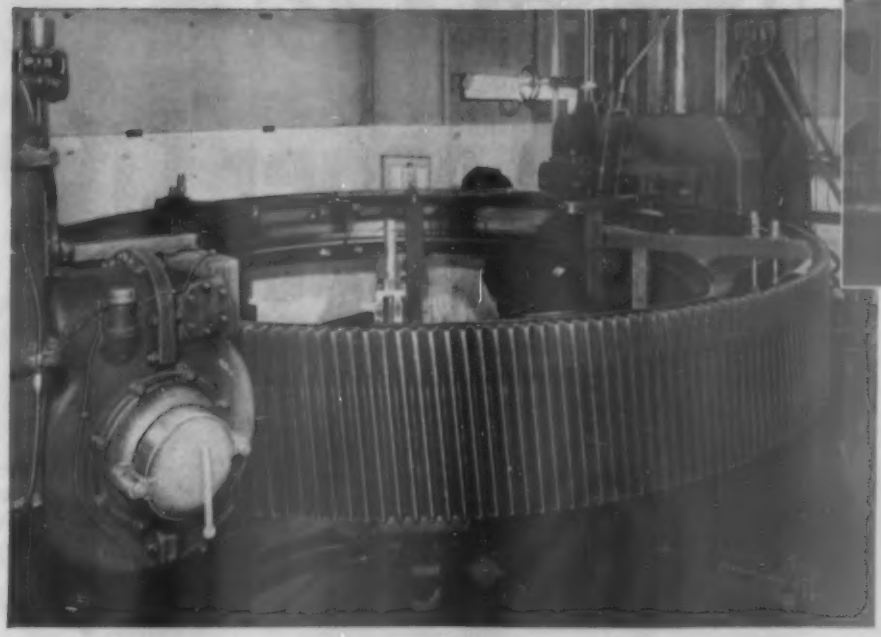


ABOVE: In foreground, split ring herringbone gear, 16 ¾ feet in diameter. In background, a single helical gear is being rough-cut on special hobbing machine (which also can cut herringbone or spur gears).

LEFT: Split ring gear receiving final cutting on special hobbing machine, designed and built by Falk. It is operated in a temperature-controlled room to minimize dimensional variations.

Here's how MODERN GEARS can SAVE MONEY for you . . .

• Are you making the mistake of driving your costly mills and kilns with gears of antiquated design—or with gears made to a price, rather than to the topmost standards your operation deserves?

Falk Helical Gears—the modern gears for modern needs—can bring you these substantial savings:

1. They last longer, hence reduce your over-all gear investment.
2. Pinion replacement can be sharply reduced when gears are properly proportioned and installed, and adequate lubrication and enclosures are provided.
3. They give better performance and longer life to your driving and driven machinery.
4. Their higher possible ratios permit use of higher-speed motors—a saving in motor costs and in power bills.

As the country's largest supplier of precision gearing, Falk is the manufacturer best equipped to *recommend without prejudice* the exact gear most suited to your specific application. Whatever type gear your job demands—single helical, herringbone or spur—Falk has unsurpassed facilities to engineer and produce it.

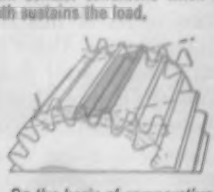
You are invited to contact any Falk representative—also, **write for Report 6170,** "Advantages of Helical Gearing"

THE FALK CORPORATION, 3001 W. CANAL ST., MILWAUKEE 8, WISCONSIN

GEAR FACTS FOR ENGINEERS

The greater capacity of Falk Helical Gears, whose teeth are cut obliquely across face, is shown by the sketches below. When helical gears mesh, two or more teeth are always in contact; they share the load. Result: maximum contact area, greater capacity and strength.

By contrast, on gears with teeth cut straight across the gear face (as in spur gears), there are alternately one or two teeth in contact when gears mesh. Result: Very small contact area. The load-carrying capacity (rating) is determined by minimum contact conditions when but one tooth sustains the load.

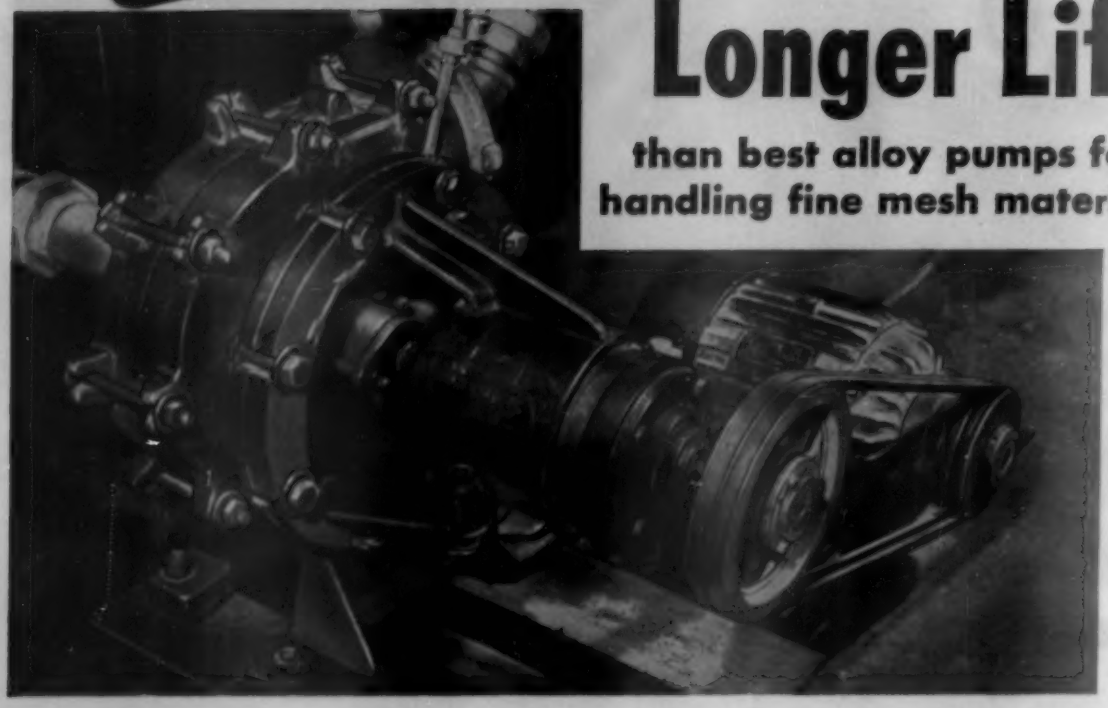


On the basis of comparative sizes of contact areas of the two gear types, the high capacity of helical gears over competing types is apparent. Engineers, operators and maintenance men who have experienced the advantages of Falk Helical Gears are unwilling to "settle for less".

ALLIS-CHALMERS Rubber-Lined PUMP

Up To 50 Times Longer Life

than best alloy pumps for handling fine mesh materials



PERFORMANCE records from twenty years of handling all types of slimes, slurries and other fine mesh abrasive suspensions show definite savings from the use of Allis-Chalmers Rubber-Lined Pumps. Instances of 10 to 50 times the life of the finest alloy pumps built for this service are common. Not only are pumping costs reduced, but production lost from shutdowns is almost eliminated and standbys often can be done away with.

Unique Lining Method

One secret of this amazing record is the rubber lining of the Allis-Chalmers pump. It is bonded to a heavy steel skeleton which is simply fitted into the casing. The lining and the casing are not bonded together. When the lining finally must be renewed, the pump need not be removed from its location. Replacement cost is kept to a minimum.

Each Installation Specially Engineered

Every pump is individually engineered to provide the best possible performance for the application involved. Special rubber linings of various compounds are available to handle a variety of slurries at low per-gallon pumping cost. Allis-Chalmers can furnish a complete coordinated pumping unit — pump, motor, control and drive — ready to install and run.

If you are handling sand, taconite, grinding mill discharge, tailings or any other abrasive slime or slurry, ask your Allis-Chalmers representative to show you how you can get long pump life and low cost per gallon pumped. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, and ask for Bulletin 52B8156. A-4768

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

FLUID PETROLEUM

(Continued from page 98)

Of the five kilns at Permanente, kiln No. 1 was selected for the fluid coke testing, primarily due to its ease of access and adjacent space for setting up test equipment. Surplus material and equipment around the plant was used whenever possible. Because of the high plant production schedule, it was not possible to shut down the kiln either to make modifications in the burner arrangement or to assist in the actual tests. This requirement made mandatory the use of existing 4-in. diameter oil burner housing and adapting it to handling coke in a high velocity air stream.

The fluid coke was transferred from the open dump truck to a 7-ton elevated bin adjacent to the kiln by means of a bucket elevator. To this bin was fitted a hopper bottom that connected directly to a 6-in. screw conveyor pipe. The conveyor screw was driven by a vari-drive unit with a speed range of 4 to 1. Coke discharging from this conveyor was aspirated by compressed air through the special burner into the kiln. A maximum of 6¾ tons of coke per hr. could be handled with this arrangement through the 4-in. burner port.

Preliminary runs were made on March 17, 18, and 22, 1955, burning the raw fluid coke as received without screening or grinding. The maximum firing used during these tests was about 3½ tons per hr. delivered to the kiln with natural gas furnishing the balance of a necessary heat input. During these runs, each of which was about 2 hr. duration, a drop out of large particles of unburned coke was observed which were later found in the analyzed test clinker.

These preliminary tests suggested the potentialities of fluid coke as a fuel. Because of the drop out of the larger particles, some of which were approximately ⅜-in. in diameter, it was decided that the coke should be ground to a more uniform size for subsequent testing. Accordingly, about 10 tons of the coke were ground, having the following screen analysis:

Screen Analysis	Cumulative Percent Retained
18	0
50	1.0
65	11.0
80	20.1
100	50.3
200	75.5

Weight of ground material:
Tamped, 62.4 lb./cu. ft.
Loose, 56.7 lb./cu. ft.

The methods developed by Kaiser Engineers lead us to believe that on a commercial basis this grinding can be done for less than 30 cents per ton.

A preliminary run with the ground coke was made on May 5, 1955. With the input of primary air for coke combustion at 600 c.f.m. and 80 p.s.i., and with 50 percent natural gas as the auxiliary fuel, the color, shape of the flame, lack of fall-out, and ignition 10 ft. beyond the nozzle indicated a performance almost identical with 100 percent gas flame. This was followed on May 18 with a commercial scale demonstration under similar conditions which was witnessed by representatives of oil companies and other large industrial firms. The limited supply of ground coke available permitted only a brief demonstration. The 14,400 lb. of coke in the hopper was consumed in 1.2 hr. The maximum firing rate of 13,500 lb./hr. was attained after a rapid build up of coke flow during which time the gas was reduced accordingly. Auxiliary firing of gas in reduced quantities was necessary to maintain input heat balance, but for several intervals of short duration the gas was turned off permitting the kiln to operate entirely on coke. The normal natural gas fuel consumption of this kiln is approximately 212 m.c.f./hr. with 1100 B.t.u./s.c.f. gas or 233,200,000 B.t.u./hr. Since the heating value of coke is 14,300 B.t.u./lb., about 17 percent of the normal gas flow was required to maintain kiln temperature.

Sampling devices and other test equipment was set up well in advance of this demonstration in order to obtain the maximum amount of information during the test. Other than the temperature checks within the kiln itself, the sampling and testing was accomplished at both ends of the kiln; of the clinkers for any significant change in composition; and of the effluent gases for any significant change of analyses, particularly with respect to sulfur.

During the test the kiln temperatures rose from approximately 2680 deg. F. to about 2800 deg. F. and the back end or gas outlet end of the kiln rose from 680 deg. F. to 705 deg. F. The uptake draft was kept constant at 2 in. of water.

(Continued on page 120)

● Historically, the petroleum refining industry has been faced with the problem of reducing the percentage yield of residual fuel oil based on crude oil. Since it is the only major petroleum product selling for less than the cost of crude oil, there exists a considerable economic incentive for reducing the yield of residual fuel oil with an accompanying increase in lighter products. The total annual demand for residual fuel oil in the United States has remained substantially constant during the period 1950-1953, and showed a reduction of about 7 percent in 1954. During this time the demand for gasoline and light products has been steadily increasing. Forecasts indicate that this trend toward a reduction in residual fuel oil and an increase in lighter products will continue.

The refining industry has utilized various processing methods for reducing the percentage yield of residual fuel oil, including visbreaking, vacuum distillation, propane desasphalting and delayed coking. All of these methods have been used not only in the reduction of residual fuel oil yield but also in the increase of gas-oil suitable as charge stock for catalytic cracking. This in turn has increased the production of high octane gasoline and distillate fuel oils to meet the changing market requirements.

In August, 1953, the new fluid coking process, developed to produce a maximum reduction in residual fuel oil yield was announced by its licensor, Esso Research and Engineering Co. The first commercial application of this continuous process was installed by the Carter Oil Co. at their Billings, Mont., refinery where a 3800 bbl. per day fluid coker went on stream in late 1954. In comparison with the earlier delayed coking process, fluid coking produces about twice the yield of gas-oil which can be cracked to high octane gasoline and only about half the yield of coke.

The by-product coke produced by the fluid coking process is a new industrial material in the form of a dry, hard, granular solid having roughly the particle size of coarse sand. It is composed of approximately 90 percent carbon with the other constituents varying considerably depending upon the source of the crude.

From the standpoint of the petroleum refining industry, the problem is not in the facilities for the production of fluid coke but rather in the development of suitable markets that will utilize the potential of this material. A substantial amount of research and development work directed at new market applications for fluid coke has been and is being carried on by different groups in several fields of industry. Although it is likely that some high value usages can be developed such as carbon electrodes for use in the electrolytic reduction of aluminum, it appears that the ultimate base load for this material will be as a fuel. In this use it should have wide application because of its high heating value, its low volatile matter, low ash content and because it can be produced in large quantities at widely separated refinery locations. It has already been successfully burned in a rotary kiln and is equally adaptable for use in oil heaters and boiler installations.

How this giant crusher changed an industry

● Here's the giant of them all . . . the world's first 4248 overhead eccentric jaw crusher . . . the new PIONEER powerhouse that changed an industry!

Big, tough jobs such as turnpike construction demand *tremendous production* of crushed stone *at the lowest possible cost!* No equipment could completely fill this demand until PIONEER introduced this new 4248 crushing giant. And in filling the demand, it changed the thinking and production methods of the industry.

Big Production With 3 Big Savings

Production demands are much more easily met when you have this crusher on the job. For example, a PIONEER 4248 on the West Virginia Turnpike job crushed rock at the almost unbelievable rate of 700 tons per hour with 100 per cent crushing and a jaw setting of only 7 inches!

But it does a lot more than meet record-breaking production schedules. It results in *three big savings.* It saves the difference in cost between it and expensive *multiple* crushers; it saves drilling and blasting costs because it takes rock up to 40" x 46" in size; and it saves quarry-loading costs because fewer and larger loading machines can be used.

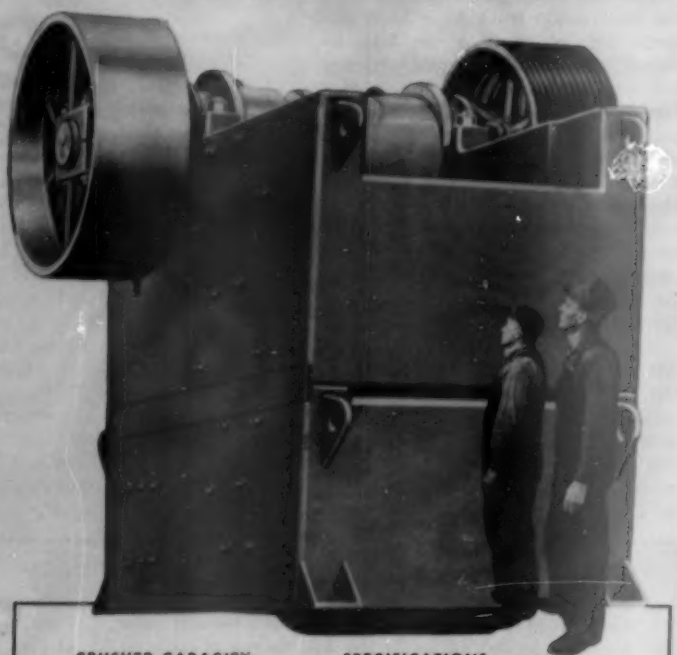
Why Maintenance Costs Are Low

Features which reduce maintenance and down time: box-type, all-welded steel base which gives added strength with over-all reduced weight . . . jaw plates cast of tough manganese steel and designed to absorb cold flow and peening . . . split jaw plates which are reversible for double wear . . . self-aligning anti-friction bearings, precision fit for smooth and lasting performance . . . inner and outer eccentric shaft bearings mounted closer together than on any other anti-friction bearing crushers to lessen shaft strain.

In those cases when maintenance or repair *is* needed, oil pressure expands inner bearing races so bearings slide easily on the shaft if you wish to inspect or remove them. A hydraulic ram holds pitman arm forward when you need to replace toggle plates. Split flywheel hubs make removal and installation simple. You can quickly reverse jaw plates without special tools.

Ask your crusher salesman these questions:

1. Are bearing housings saddle-mounted to assure constant alignment?
2. Is it possible to remove bearings hydraulically?
3. How closely spaced are inner and outer bearings?
4. Can jaw setting be adjusted by hydraulic means?
5. Can toggle plates be changed with hydraulic assist?
6. Are flywheels provided with split hubs for easy removal?
7. Is crusher made with split base for easy installation?
8. Does crusher have 2 tension rods?



CRUSHER CAPACITY

Field operations indicate that for each inch of jaw opening, capacity increases approximately 100 tph. This rate is with a relatively high crushing percentage. In field installations, production has reached 700 tph with 7" setting.

SPECIFICATIONS

Jaw opening	42"
Width of jaws	48"
Range of setting	5"-12"
Over-all depth, moving jaw	104"
Over-all depth, stationary jaw	90"
Weight (approximate)	94,200 lbs.
HP required	180-210

PIONEER ENGINEERS WORK HAND IN HAND WITH YOU

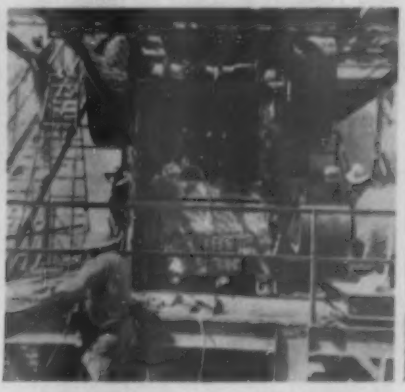
In Tyler Breslin Quarry's high producing PIONEER Turnpike Plant (shown at left), output of the 4248 Jaw Crusher often exceeded 700 tph with 7" jaw setting.

This plant also illustrates the factory-distributor-owner teamwork for which PIONEER is so famous. First, the Distributor analyzed requirements and sent the data to PIONEER's Engineering Department which prepared complete erection prints. Then an experienced PIONEER engineer was sent to supervise installation of the plant.

But PIONEER's responsibility didn't end then. Its alert Distributor Service Organization and factory-trained maintenance men are always on call whenever quick service is needed.

In this installation the primary plant feeds a system producing six different sizes of rock and sand. Heart of the system is a PIONEER 174 Primary which has a 48" x 16' PIONEER ORO Feeder and a PIONEER 4248 Jaw Crusher. The feeder is constructed of ⅝" thick cast manganese steel pans with integrally cast links, which withstand the huge loads dumped by quarry trucks. It correctly positions large, odd-shaped rocks before they enter the crushing chamber of the 4248 Jaw Crusher. It also controls the amount and rate of feed to the crusher so that maximum output is reached and maintained.

Workmen are dwarfed by PIONEER's 4248 Jaw Crusher. Designed to reduce blasting and drilling costs, and to turn out enormous tonnages, this 95,000 lb. giant is owned by General Crushed Stone Co. of Easton, Pa.



This PIONEER 4248 Jaw Crusher is part of the Apex plant of U. S. Lime Products Co., Las Vegas, Nevada. Note hydraulic mechanisms for holding pitman forward when adjusting crusher setting or changing toggle plates.

PIONEER assembles 4248 Jaw Crusher. Here you see the 19,000 lb. pitman arm with the 5200 pound shaft assembly being lowered into the 4 cu. yd. crushing chamber. Length of moving jaw is 104", stationary jaw 90".

For further details write Pioneer Engineering Works, Inc., Minneapolis, Minnesota (subsidiary of Poor & Company, Chicago) or your nearest PIONEER distributor.

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- ☐ JAW CRUSHERS
- ☐ APRON FEEDERS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS
- ☐ ORO FEEDERS
- ☐ CONTINUFLO CONVEYORS

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INDUSTRIAL SAND

(Continued from page 90)

it would not cost the employer extra to hire handicapped workers.

Prompt and compulsory reporting of all disabling injuries including occupational diseases is another goal as is the establishment of adequate rehabilitation centers.

In conclusion, Mr. Gurske said that many grievances of workers would be lessened if state workmen's compensation laws be amended to meet the problem more realistically.

Association counsel Theodore C. Waters followed Mr. Gurske's address with a report on trends in workmen's compensation legislation. Mr. Waters reviewed some matters of special importance and said that there is a place for efforts both by the government and industry in attempts to find a solution to problems incident to employer and employe relationships. Compensation for industrial injuries is one of the more important problems.

Mr. Waters commented on the basic recommendations made by Under-Secretary of Labor, Arthur Larson. Mr. Larson's thinking, he said, could be summed up in a simple statement, that there is a changing concept in workmen's compensation that would ultimately lead to the payment of compensation for wage loss sustained by employes, assuming that the loss was occasioned by some industrial injury irrespective of the cause.

Under such philosophy, said Mr. Waters, problems arise with respect to administration of the law that would impose upon industry liability for all wage loss irrespective of the cause. Administrators in industrial states are prone to be prejudiced in favor of the claimant in any compensation case. This being so, the burden of proof is on the employer to show that the injury did not arise out of and in the course of employment and that the extent of the injury is less than that claimed.

Cases having no merit which are awarded compensation serve to prejudice other cases meriting compensation where compensation payable is inadequate for the injured employe, said Mr. Waters.

He next made reference to the five general purposes in the program of the Federal Department of Labor. With respect to the elimination of scheduled coverage for occupational diseases, he is in agreement but pointed to peculiar problems applicable to some of the diseases including pneumoconioses, dermatoses, impairment of hearing, cancer and heart disease.

Among the factors are the potential effect of industrial exposure in other employment prior to that in which disability occurs, complicating factors of age and contributory diseases, the problem of proper medical diagnosis and prognosis, and evaluation of the disability. These factors justify legislative limitations, in his opinion, to protect an employer and the insurance carrier from inequitable claims.

As far as payment of compensation based upon two-thirds of the employe's average weekly wage with no ceiling is concerned, it is Mr. Waters' opinion that it may serve as an incentive for malingering and impose staggering costs upon employers.

He was critical of the Department's recommendations for material increases in death benefits, pointing out that many widows may find employment or, because of re-marriage, not require economic aid. With proper administration, he agrees with the Department's recommendations for unlimited benefits for medical care and hospitalization.

Mr. Waters commended the association for its efforts and progress in in the field of engineering control to lessen plant hazards, and he urged that company executives continue to spark this program of clean up and safety in operations. He attended a meeting of producers at Pittsburgh with Theodore Hatch of the Industrial Hygiene Foundation for discussion of plant problems and hopes that more such conferences will be held.

He endorsed the work of the health committee in drawing up a proposed medical program for the membership. The role of the company physician is vital in his opinion. Among proposals is to appoint an individual member of a company to carry out the medical program and to accumulate valuable medical information from examinations. Commenting generally on insurance coverage, he urged that companies pay closer attention to their relations with carriers. They should be prepared with engineering and medical examination records to convince the carriers that they have available defenses against improper claims.

Plant Control

Theodore P. Hatch, Director of Research, Industrial Hygiene Foundation, Pittsburgh, Penn., who has been studying dust conditions at plants of the industry, reported on recent observations and he covered generally the subject of plant engineering control and other aspects of a sound program for health control. New plants into which dust control features have been designed, and rehabilitated older plants have come in for study under the program to improve working conditions. He spoke briefly on the evaluation of performance and progress, and he also discussed the need for worker education, the use of respirators, analyses of exposures and medical aspects.

The value of pre-employment medical examinations and re-examination at six months' intervals in order to check on changes was stressed. The same man should handle X-rays and every care should be taken that diagnosis be accurate. He recommended that each worker in dusty exposure be provided two respirators for his personal use and that complete instructions as to their use and reasons for use be provided. He advocated that routine dust counts be taken in plants as a guide to reaching the goal of no more than two million particles of dust per cu. ft. of air. He offered to make laboratory facilities available in Pittsburgh in order that groups of producers may be taught how to measure dust concentrations, and suggested that a week's school be conducted on how to design dust control features into plants.

Earle T. Andrews, chairman of the advisory committee on health, reported progress of his committee which is concerned with both engineering and medical aspects. A Summer forum was held on dust collection and it is hoped to hold another one soon.

Grading of Sands

A progress report of the committee on fineness and grading of foundry sands was presented by chairman William D. Chadwick. The committee has been very active and has met jointly with a committee of the A.F.S. The good to be accomplished is one of education of foundry sand customers into problems of the industry.

Test methods and specifications have been discussed and there will be an article published in "Metal Castings" on the subject of grain sizes of sand and their distribution. Grain size distribution and the A.F.A. fineness number being the bases of the committee for the purchase of sand, it is the thinking that producer and customer must set up their own standards to adhere to, since values differ between all companies. Tentative standards for clay determination for carbon-bearing sands are to be drawn.

The committee is to study sampling procedures and come up with a report. It is the consensus of the N.I.S.A. committee that sampling should be done at the shipping point where cars are loaded, likely through taking a full stream cut as a car is loaded and quartering down for a suitable sample. It was requested that the membership tell the committee in detail how their samples are taken and the frequency.

(Continued on page 110)

GAS TURBINES
Supply All Power Needs of Venezuela Cement Plant

By L. W. PASSMORE

SINGLE-STAGE GAS TURBINES with regenerators are being used by C. A. Venezolana de Cementos, Pertigalete (Venezuela), in its power plant. Each of the two Brown-Boveri gas turbine-generator sets has a terminal output of 1650 kw. with an air intake temperature of 35 deg. C. Table "A" gives the main data of these machines.

Table "A": Technical data of the 1650 kw. gas-turbine

Terminal output of generator	1650 kw.
Intake air temperature	35 deg. C.
Overall efficiency	21 percent
Pressure ratio of compressor	3.0
Turbine inlet temperature	600 deg. C.
Speed of gas turbine	5350 r.p.m.
Speed of generator	1800 r.p.m.
Air quantity of compressor	28 kg./s.
Regenerator effectiveness	80 percent

Both gas turbines have operated since 1949 without trouble. Acceptance tests were carried out after the first set had completed 1100 operating hours and the second, 2000 hr., with an energy production of 1.3 and 2.1 million kw.h., respectively. As the operation of the cement plant depended entirely on the two gas turbines, which formed the sole power supply until recently, it was not possible to carry out the tests at constant load. The only method that could be adopted with the varying operating load was to determine the energy produced during a period of several hours, to measure the quantity of fuel consumed during this period, and to calculate the efficiencies from the averages. The results obtained in this way, which are plotted in Fig. 1, might possibly have been even more favorable if the load had remained even approximately constant during the tests.

During this period both sets remained free from disturbances. However, on three occasions one of the gas turbines was shut down by the respective safety device when abnormal working conditions occurred: once due to overload, by the thermal protecting device; once when the oil supply pipes were incorrectly changed over; and the third time by the emergency governor (which was set a little too low) when the load was suddenly thrown off. The average daily outputs between 7 a.m. and 5 p.m. attained 1500 kw., the maximum average hourly output 1650 kw.; the monthly average of the fuel consumption was 0.49 to 0.52 kg./kw.h. and the daily average of machine (I) was 0.458 kg./kw.h. and that of machine (II) 0.476 kg./kw.h. During this time both machines ran for 630 hr. without interruption. Toward the end of the second year of service, cement production increased to such an extent that the energy consumption was almost doubled. The daily average output is now between 70,000 and 73,000 kw.h. which corresponds to an average capacity of 2910 to 3040 kw.h.; this corresponds to almost full load for both machines. The fuel consists of a mixture of 60 percent heavy fuel oil and 40 percent diesel oil. The turbines are started on diesel oil. (Fig. 2).

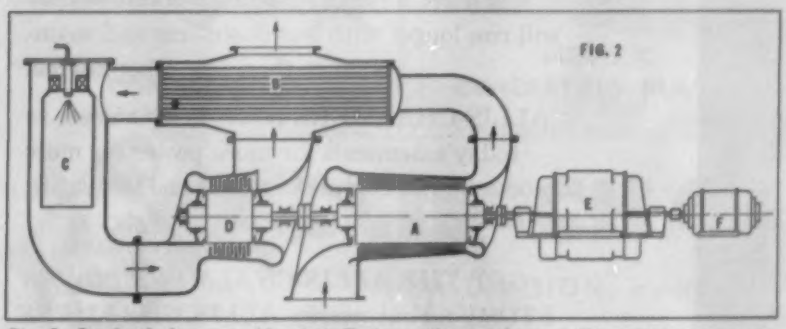

Fig. 2: Single shaft gas turbine installation with regenerator: (B) is the regenerator which returns part of exhaust heat to the working cycle

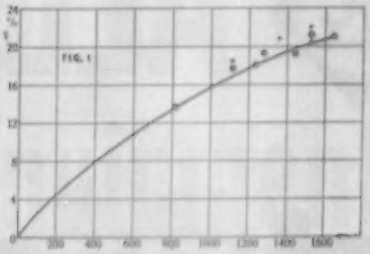

Fig. 1: Overall efficiency of gas turbine installation in cement plant
Note: The plus sign + represents measured values from acceptance tests; (+) designates conversion to air intake temperature as guaranteed; × represents check tests on gas turbine No. 2 after 15,000 hr. operation; (×) designates conversion to guarantee conditions. The abcissa represents terminal output in kw., and the ordinate is the overall efficiency in percent

As these two gas-turbine sets have been in operation for over 3½ years, some notes on their maintenance can now be given. Operating experience to date has shown that maintenance costs for gas-turbine installations are very low. Maintenance comprises the following:

1. As the fuel used is a residual oil with a high ash content and contains a high proportion of vanadium and sodium, ash deposits on the turbine blades are unavoidable. The deposits are washed out after 900 operating hours. This cleaning causes no trouble and takes very little time. The turbine, which is first cooled to a given temperature, is turned by the starting motor while the water is injected onto the blades through a built-in washing device. After washing, which may take one or two hours, the gas turbine is taken into service again immediately. In spite of the large proportion of insoluble ash, it is possible to clean the turbine thoroughly. As the gas inlet temperature to the turbine is not more than 650 deg. C., the blades remain quite free from corrosion.

2. The regenerators are cleaned in service by built-in soot blowers which take their compressed air from the gas-turbine set itself.

3. The blades of the compressor have to be cleaned (washed) after about 3000 operating hours as gradual clogging up with cement dust cannot be prevented completely even with an air filter.

4. The fuel jets are changed over about every 3500 hr. The old jet is inspected and parts which have been eroded by fuel containing sand and which might cause incomplete atomization are replaced, thus enabling the jets to be used again.

5. The use of heavy oil causes a certain amount of wear in the combus-

(Continued on page 110)

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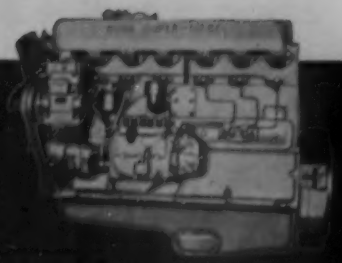

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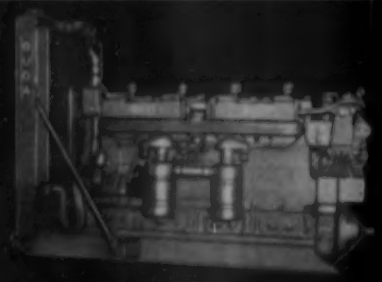

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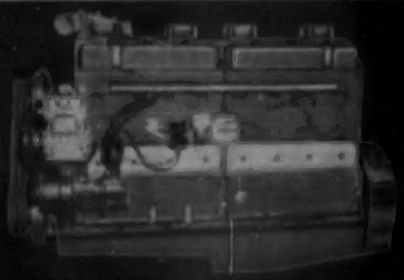

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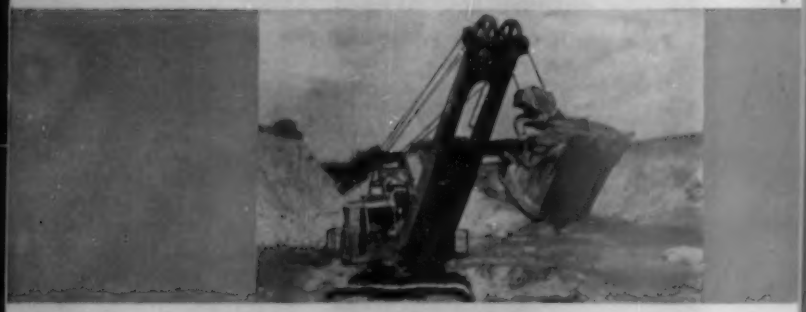
There are no "compromise" engines in the ALLIS-CHALMERS line. You can specify or install the *exact* type, size and fuel engine to fit any piece of construction equipment from a small pump to a giant dragline — and be sure you're getting the kind of power that pays off in more production and lower cost per horsepower hour of operation.



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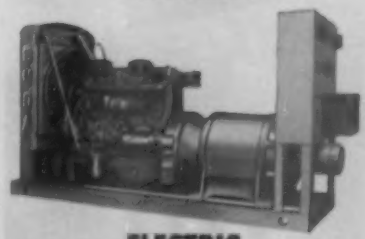

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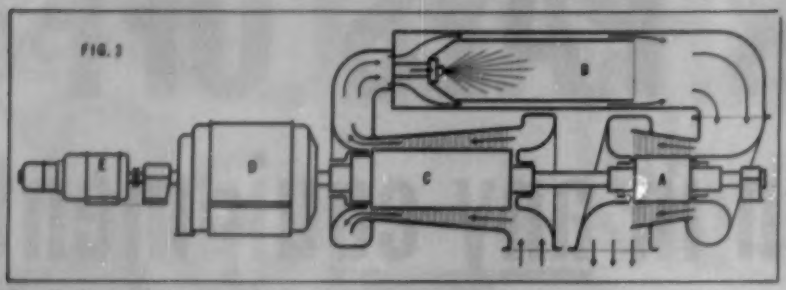

Fig. 3: Single shaft gas turbine without regenerator: (A) is gas turbine; (B) is the combustion chamber; (C) is the axial compressor; (D) is the alternator or generator; and (E) is the starter motor and exciter

tion chamber lining. During the periodic checks, some of the easily removable elements, which compose the inner, flame-resisting wall, are exchanged as required. Until the spring of 1953 about 70 such elements had been changed in each chamber of which 25 could be still used. Thus, in 18,000 operating hours, 45 lining elements have actually suffered deterioration. As each chamber contains about 250 elements, one set will last many years.

The consumption of lubricating oil is extremely low. After more than 18,000 operating hours the lubricating oil is still in perfect condition and should not have to be replaced for a long time.

The gas-turbine and compressor blades have performed very well. Apart from the internal combustion chamber elements and a few eroded liners in the fuel jets, no parts have been replaced up to now. The cost for spare parts is thus extremely low, amounting to about 0.035 Swiss cents per kw.h. produced.

These machines have shown that gas turbines stand up well in industrial operation even when heavy fuel oil with a high vanadium content is used.

A third gas turbine of 5000 kw. capacity has now been in active service for well over one year in the Pertigalete cement plant, (Fig. 3). It is fired with natural gas and has proved its worth during over 3500 operating hours. A fourth gas turbine set, also of 5000 kw., will be added. These two 5000 kw. machines are of the single-stage type without regenerators.

After 14,000 hours operation, the rotor of the heavy-oil fired gas turbine in the Pertigalete cement plant was carefully inspected on the occasion of an overhaul and showed no signs of corrosion or of deposits.

Canadian Cement Output

CANADIAN CEMENT PRODUCTION increased 22 percent in July, 1955, to 2,429,538 bbl. from 1,978,572 bbl. in July, 1954, according to the Bureau of Statistics. Total for the first seven months of 1955 was 13,787,320 bbl., up 5 percent from 13,034,795 bbl., a year previous. Shipments were 11 percent higher, and increased 6 percent over the seven months. Month-end stocks at warehouses were up 13 percent in July, 1955, as compared to July, 1954.

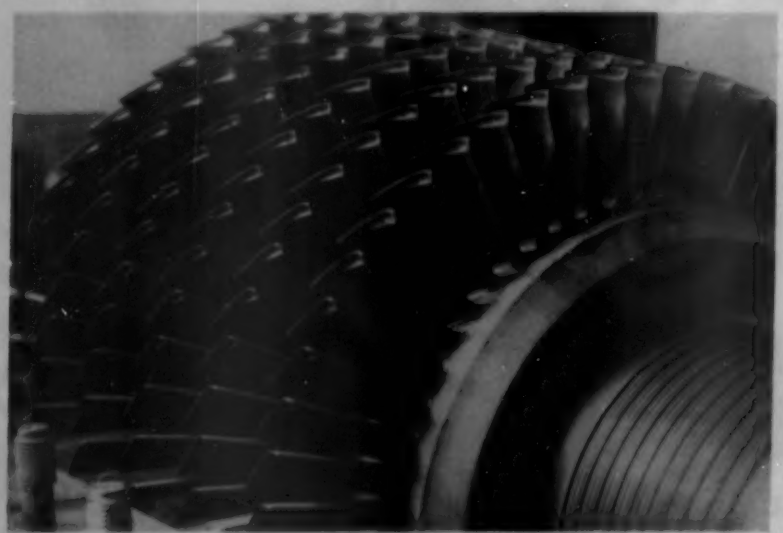

Fig. 4: Turbine blades as they appeared after opening casing at end of test period

INDUSTRIAL SAND

(Continued from page 106)

A summary of the findings will be the basis for a statement to the A.F.S. Committee. Discussion brought out that producers cannot duplicate sizings through testing of samples, which has always been a difficult problem.

Stanton Walker, consulting engineer, in his discussion of the size and grading of sands, commended the committee for establishing machinery to get the point of view of the industry over to the foundries.

Commenting on research being done to develop a surface area specification, Mr. Walker said that the surface area as used actually is the A.F.A. fineness number. There is a need for accurate method of grading, said Mr. Walker, but he pointed to many problems that complicate doing so. For example, there might be as many as 12 size fractions specified and the number of combinations of gradings from these sizes would run into the millions. The search for some number to identify a grading has been going on for years.

Results from size testing have not been too reproducible, he said, and the sampling of cars at destination is impractical. Sampling is a most difficult problem and he believes the committee will be disappointed in its attempts to arrive at a suitable standard method. The best that can be done, in his opinion, is to send the most qualified man available out with instructions to get the best possible sample.

Mr. Walker also thinks the 50-gram standard sample is much too small to be representative of a car. Bead tests for purposes of calibration of sieves have not proved out. Another point brought out was that very broad tolerances are permissible in sieves due to limitations in their manufacture, and yet such sieves are standards. Other complications to testing are the wear of testing sieves, blinding, methods used and other variables.

Mr. Walker concluded with a technical discussion, illustrated by slides, of various methods for measuring fineness and size distribution. One of them that provoked special interest was a triaxial chart for the blending of size fractions to a desired gradation.

Miscellaneous Business

There have been attempts made by customers to have producers pre-pay freight on shipments. Discussion developed that this is not a trend and the industry is refusing such demands and following traditional policy in pricing f.o.b. plant.

There is a critical shortage of covered hopper cars and the association

(Continued on page 118)

One of the nation's major sources of titanium, this open-pit has produced 15,000,000 tons of ilmenite-magnetite ore and 8,700,000 tons of concentrates since its start in 1942. Over 17,000,000 tons of rocky overburden have also been removed. Entire deposit is 1800 ft. long, 900 ft. wide; averages 35% magnetite, 32% ilmenite, 10% feldspar and 23% iron silicates. All ore and waste must be shot...drill holes are sunk with a 42-T churn drill using a 9 inch bit, to 39 ft. deep. From 350 to 500 lbs. of 90% gelatin dynamite are used per hole...each lb. breaks up 3½ tons of waste and ore. A 4-yd. shovel, together with four 22-ton rear-dump trucks, loads all waste ...two 2½-yd. shovels, together with seven 15-ton trucks, move the ore. Finished ilmenite goes to processing plants, for conversion into titanium dioxide pigments for paints, paper, rubber, ceramics, and other substances. Magnetite concentrate is both converted to sinter and shipped raw to various iron, steel, refractory, and cement plants.

How rubber-tired tractors cut costs for one of world's largest titanium mines

In the heart of the Adirondack Mountains in upper New York State lies a mine which is one of the world's largest producers of titanium. From a pit 900 ft. x 1,800 ft. comes 3,200,000 tons of ore and waste yearly. Two rubber-tired Tournatractors shuttle back and forth to handle tractor work at pit, stockpiles, and plant.

1 tractor cleans around 3 shovels, 1 dropball, 11 trucks

One of these 19 mph 208 hp units is assigned mainly to pit and dump clean-up. At the pit, it cleans around *two* 2½-yd. shovels, *seven* ore-hauling trucks, *one* 4-yd. shovel, *and* a rubber-tired dropball crane. At the dump, a mile away, it cleans up for a fleet of 4 end-dump trucks. Rig shuttles continuously between assignments. A 300 ft. trip between shovels takes as little as 20 seconds ...the mile from pit to dump takes 3 to 5 minutes. Despite this busy schedule, tractor finds time to move air compressors, drills, and other pieces of pit equipment.

Another dozes magnetite weighing 4800 lb./yd.

The second Tournatractor is used primarily on the magnetite stockpile. Here it dozes concentrate within range of clamshell that loads railroad cars, or else dozes directly into a hopper. Rig's blade often carries 2½ cubic yards of material — weight *6 tons!* When needed, this tractor moves to other stockpiles to doze ilmenite concentrate or coal. Occasionally, it spots railroad cars in the sintering plant area. As needed, it cleans spillage from roads and haulage ways, and does other odd jobs. Wherever it goes, rig's low-pressure tires do no damage to footing. They roll easily over pavement, railroad tracks and ties.

Each costs $1 less per hour to operate than crawler-tractors

On shovel clean-up jobs, owners report Tournatractors outproduce the biggest crawler-tractors, 2-to-1. Units usually work at higher speeds and move job-to-job at higher speeds. Tournatractors cost less to maintain, too...4 tires eliminate the headaches of 500 to 600 track parts. Lowered maintenance, plus lower repair and operating costs are proved by accurate figures kept by the mining company. These show cost to operate Tournatractor "averages" approximately *$1.00 less per hour than their records of average cost for crawler-tractors.*

You judge its advantages

Tournatractor's lower costs, "go-anywhere" mobility, and fast-working speeds can pay off for you, too! Ask your LeTourneau-Westinghouse Distributor for a demonstration of this versatile machine so you can judge its advantages for yourself!

Tournatractor—Trademark Reg. U.S. Pat. Off. T-752-4-bw

▼ Dozing stockpiled magnetite, Tournatractor moves up to 2½ bank yards (about 6 tons) per push.

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PUBLIC RELATIONS
Take Spotlight at Directors' Meetings

• National Sand and Gravel and National Ready Mixed Concrete Association directors also consider convention exhibits, labor legislation, cement problem, depreciation

FALL MEETINGS OF THE BOARDS OF DIRECTORS of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, held September 26-28 at Hot Springs, Va., were extremely well attended. Attendance was almost 100 percent for both boards, and likely set a new record for both associations.

Separate meetings of the two boards were held the first two days followed by a joint session the third day to consider matters of interest to both industries.

Directors—National Sand and Gravel Association

The high points of general interest at the meeting of the board of directors of the National Sand and Gravel Association, September 26, were concerned primarily with the plans and activities of the newly appointed Committee on Public Relations. This committee had its first formal meeting in Chicago, Ill., August 17, and a full report of the meeting was submitted by its chairman, E. K. Davison, of Pittsburgh, Penn. Present to hear and act on his report was every active member of the board of directors, with three exceptions, making this meeting about the best attended of any in the history of the association.

The session opened with the usual address of the president and chairman of the board, John W. Murphy, Spokane, Wash. President Murphy's remarks were brief and to the point, that the association had enjoyed another highly successful year. The splendid attendance at this meeting was ample evidence of this success and of interest in the newly established committees. He favored a continuation of special summer meetings of these committees, to be held in convenient places. The rest of his remarks concerned mostly a change in bookkeeping methods for handling the finances of the two allied associations—Sand and Gravel, and Ready Mixed Concrete.

Chairman R. P. McKenrick, of the Manufacturer's Division of the N.S.G.A. and N.R.M.C.A., reported that demands for exhibit space at the 1956 Show in Chicago (at the Coliseum) already exceeded supply by about 15 percent, requiring a proration of exhibit space. This was considered evidence of the wise choice of the association to hold an outside show. The exhibit will be open every day, for the best part of the day, regardless of the meetings of the association, which will be held in the hotel, which is a mile or more from the Coliseum. It is assumed operating men will be more interested in the exhibit and gain more from it, than from most of the business sessions. Contractors, engineers and members of the National Agricultural Limestone Institute are invited to see the exhibit.

Not all the members of the Manufacturer's Division are enthusiastic about an outside show, especially since the exhibit of the National Crushed Stone Association, the following week will be an inside-the-hotel show, and there are many exhibitors who will be represented at both shows. R. D. Ketner, a director representing the Manufacturer's Division, expressed the point of view of these members, but said they were quite willing to go along and try the plan at least once, although for those who exhibit at both shows, the added expense will be considerable.

Percentage Depletion

Chairman J. Rutledge Hill, of the Committee on Taxation and Percentage Depletion, made an argument for 15 percent depletion allowance in place of the present 5 percent. However, he pointed out that under the present outlook producers in this and other exhaustible natural resource industries must be perpetually on guard to preserve what they have. The next session of Congress is likely to go into tax legislation in much detail, and it behooves all producers to be active in making both congressmen and the public acquainted with the economics of these natural resource industries. The information about local zoning laws, etc., developed by the Committee on Public Relations, of the association, is evidence of the difficulty in opening new sources of supply, even where the requisite material may be available otherwise.

Chairman Hill was given a vote of confidence by the board, and urged to continue his services and use his own judgment as to when and how. The motion was made by Robert Mitchell, who added that this matter of taxation is a non-partisan issue, and every attempt should be made to keep it so.

The problem of sand and gravel producers on navigable rivers was raised. These operators naturally suffer a competitive disadvantage against other producers who have percentage depletion. River producers have no property rights when working a deposit under Federal license. Nevertheless, because of the economic problems involved, Chairman Hill was requested to present their case to the government tax authorities and to Congressional Tax Committees, and he was instructed to call a meeting in the near future of such interested producers to develop their problems more specifically.

Public Relations

E. K. Davison, chairman of the Committee on Public Relations, reported that 16 of 21 producer companies with representatives on the committee met in Chicago on August 17. The chairman outlined a proposed program for the committee to work on, and then called upon each member for comments. The report submitted to the board of directors gave a transcript of these comments, which related the experience of each company represented. The chief problem appeared to be present or prospective state, county and local zoning ordinances, which are making it constantly more difficult and more expensive to open up new deposits. Heavy trucking on highways in residential districts is also causing disturbing reactions. Severance taxes are bothering some producers. Rehabilitation of worked-out properties appears to be a must.

(Continued on page 114)

Tournapull wastes 11 yard load in worked-out section of pit. Says Owner Erb, "I like Tournapull's maneuverability."

Dirtmoving through an Illinois winter

Owner reports Tournapulls wade through mud to strip 2,500 bank yards daily

Along about this time of year, you probably have done some serious thinking about winter work. The normal dirt season has carried most of the year's overhead for you, so any dirtmoving now should bring in good profits. Sure, you need the right machines and the right job! As you plan for them, perhaps you can get some ideas from this experience of the Elmhurst Chicago Stone Co., Elmhurst, Ill., and M. M. Erb, Naperville.

Starts work in November

The Elmhurst Chicago Stone Co. in November gave Mr. Erb a contract for stripping 250,000 yards of overburden from their gravel pit near Winfield, Ill. Although no completion date was specified, Elmhurst Chicago officials told Erb they "wanted stripping done as quickly as possible so their plant could run at full capacity throughout the next year."

That request meant moving dirt in late fall and straight through the Illinois winter. Rain, snow, and muddy ground would have to be overcome. The main problem for Contractor Erb was to select the machines which could work most efficiently. His choice was 2 electric-control 16-yard C Tournapulls. "I picked these machines," says Erb, "because of their well-known ability to work during rough going!"

Finishes "on time"

What happened after their November start shows how good a choice he made. The 2 C Tournapulls combined to move 2,500 bank yards of clay and loamy topsoil per 9-hour shift, day in and day out, through the winter. They averaged 1,800 ft. cycles every 4 minutes . . . at times, completed cycles as long as 2,000 ft. in 3½ minutes. Said Mr. Erb, "They went through mud better than anything else did." And they finished their 15-acre stripping assignment long before quarry operations had to be moved in from worked-out sections of the pit.

If you, too, plan work during the winter, or feel you might encounter muddy conditions any time on your job, it will pay you to check up on Tournapulls. Your LeTourneau-Westinghouse Distributor has a number of owner-verified reports like this which you can study to get some idea of costs and output. See him soon. He has a size Tournapull to fit your needs and your budget.

Loads with 225 hp pusher average 11 bank yds. of clay and topsoil. Says 'Pull operator J. W. Fossier, "This rig is simple and easy to operate. Vision is good."

Tournapull—Trademark Reg. U.S. Pat. Off. P-712-5-b

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The chairman has outlined four major activities in the various fields as follows: (1) zoning regulations, land use and rehabilitation; (2) stream and air pollution; (3) use of the public highways; (4) support of philanthropic and cultural public projects. He said that it was agreed by the committee that all attention for the foreseeable future should be devoted to the first three. He suggested that the committee's work on these projects proceed along the following lines: (1) Will attempt to outline the pattern and extent of national, state and local laws dealing with the subjects; (2) Will attempt to collect full written descriptions of outstanding work of member companies in their efforts to comply with such laws or to conduct their plant operations in such a manner as to obviate the necessity of such regulations; (3) Will prepare for distribution to the association members a comprehensive report on the data and cases collected, and will attempt to set up a procedure by which the national association staff can keep this report current.

Engineering

Director of Engineering Stanton Walker covered a variety of matters in his report, leaving some items for later presentation before the joint board meeting of N.S.G.A and N.R.M.C.A.

Whereas railroad ballast was formerly an important part of total tonnage of sand and gravel, it is now relatively small and a ballast committee had recently been organized to study the problem. A meeting had been held comprising companies that indicated interest in devoloping more volume of ballast.

Reasons for the decline in volume of this material, said Mr. Walker, have been problems having to do with the need for angularity of particle, low prices and the fact that the industry has not gone after the market. As it stands now, main line railroads in some areas will not use any gravel. The question is whether the association develop a rigid specification with respect to crushed particles which would insure good performance of gravel in such use. No definite action was taken.

In discussing the program of the operating problems committee, Mr. Walker said there was demand for two full-day sessions at the coming national convention. Beneficiation and prospecting are live topics and several papers have been scheduled on those subjects. The selection of metals for wear purposes, hard surfacing, motor fuels, among other topics will be considered in developing an exchange of ideas.

A report on the fellowship work at Purdue University on the use of sand and gravel in bituminous mixtures will be presented at the Chicago convention and there will be a paper on ballast by a prominent roadway engineer.

The association has been unsuccessful in obtaining qualified men for its fellowship program at the University of Maryland, due to the competition of high paying jobs for engineers. Two fellowships are provided for with a stipend of $1500 for ten months covering each. The board voted unanimously to increase the stipend to $2500 in an effort to secure one qualified engineer for the present.

Mr. Walker said that the annual short courses are so time-consuming on the engineering staff that he thought it advisable for the next year to hold a single short course of one week covering both portland cement concrete and bituminous concrete and the board passed on this recommendation.

The growing trend, initiated by the Army and Navy, to specify concrete on the basis of flexural strength was discussed. Requirements are of the order of 650 p.s.i. or even 700 p.s.i. which are almost impossible to meet with certain high quality aggregates and cement. Air-entrainment aggravates the problem, the addition of extra cement does not help and there are great variations due to segregation, etc. It was suggested that jobs with such specifications be refused.

Another serious problem concerns the trend in highway building to use sawed joints instead of forming joints. The choice of aggregates has bearing in the saving of costs which can reflect in favor of limestone or other softer aggregates than hard, sound gravels. It may amount, said Mr. Walker, to savings in costs equivalent to 30 cents per ton of aggregate which can have serious effects on competition involving aggregates.

Sawing of joints usually is 25—30 percent of the depth of the slab and the costs of saws alone are as high as 16 cents per ft. of cut using diamond blades. That cost may be cut to 3 or 4 cents with softer aggregates.

Tolls on Navigable Streams

E. K. Davison outlined proposals made to levy toll on companies using navigable waters for transport of their products. The Hoover Commission report has advocated that changes be made to pay for maintenance and operation of the inland waterways. An important question is whether toll fees be charged or marine fuel taxes be imposed. The latter apparently is preferred by the association, if any levy be imposed, because it would be an easier method to administer and would provide an incentive for efficiency in operation.

It was decided that the association develop data on water use from the membership and supply the Waterways Conference with complete data. The association will go on record as not in favor of such taxes bearing all the costs of construction and maintenance of the waterways.

Ready Mixed Concrete Board

All but one member (ill) of the board of directors of the National Ready Mixed Concrete Association and 11 of 13 past presidents were present at the N.R.M.C.A. board meeting.

Following the usual opening remarks of the president and reading of the financial report by the treasurer, executive secretary V. P. Ahearn reviewed the results of the committee work held in Chicago this past August. The experiment of calling all the committees together independent of the annual conventions worked out very well. Much was accomplished and a similar arrangement will be scheduled in 1956, likely at St. Louis, Mo.

Director of engineering Stanton Walker covered a number of items. He first touched upon work of the cement committee which was formed to study the problem of lack of uniformity in tests of concrete when made from cement from the same source. A program of testing in the laboratory at the University of Maryland has been set up.

At present sampling is to be restricted to five points in the United States with a sixth source used as a standard. Standard A.S.T.M. testing procedure is used and samples of cement are obtained every two weeks. Sources are Spokane, Wash.; Albuquerque, N. Mex.; Philadelphia, Penn.; and Milwaukee, Wis., with a fifth source to be chosen. These areas are considered bad source locations.

The plan is for the program to continue about one year when it will be re-examined and a decision made that it is finished or should be extended.

The authorized increase in rated capacity of truck mixers, of ½ cu. yd., is gaining acceptance, said Mr. Walker, although a few highway departments have not approved the new ratings yet. The A.C.I. is considering writing recommended practices for the production of ready-mixed concrete which, said Mr. Walker, the N.R.M.C.A. would prefer to do and in which effort it will want to at least participate.

He gained approval of the board to raise the stipend for a single research fellow to $2500, backing up the approval also granted by the N.S.G.A. board. The plan for a single week for the joint short course was outlined, as approved by the N.S.G.A. board and it was endorsed. Two days of the week will be set aside exclusively for concrete, Wednesday for aggregates and there will be three options for Thursday and Friday—concrete design, laboratory practice and bituminous mixtures in cooperation with the Asphalt Institute.

Following a lively discussion of zoning problems and complaints confronting individual producers, it was decided that a committee on public relations be appointed and this committee likely will join forces with the N.S.G.A. committee.

Merchandising

Chairman Robert C. Collins of the merchandising committee reported that good use is being made of the film "Quality Ready Mixed Concrete" and promotional material prepared by the Portland Cement Association for ready-mixed concrete producers. Copies of the film are sent to the separate state associations for re-distribution. Use has been made of the film and promotional aids in several foreign countries and the P.C.A. has also handled some of the distribution.

Vice-president James Piper and Ross Wilcox of the P.C.A. were invited to the meeting to outline a proposed program of cooperation between N.R.M.C.A. and P.C.A. on city street pavement promotion.

Cement Supply

A proposal from a member that the association make formal representations to the U. S. Department of Commerce about unfairness of shipping disproportionate amount of total cement production to government jobs developed much discussion. The Defense Emergency Act which provides for priorities where essential defense construction is involved is still on the books and, apparently, the practice of exercising priorities by government departments is sometimes abused. A resolution was passed that an appropriate letter on the subject be written to the Department of Commerce.

That subject evoked much discussion about cement supply and relations with the cement industry as well as guaranteed cement prices. The industry will require 100 million bbl. of cement this year which is a third of the total. While there was some disagreement, prevailing opinion seemed to be that the industry cultivate and work closely with cement manufacturers.

The session concluded with a report from A. C. Thomas, The Jaeger Machine Co., chairman of the Truck Mixer Manufacturers Bureau. Mr.

Thomas said that sales of truck mixers set a new record in 1955 and that four new manufacturers entered the field in 1955. There are ten members of the Bureau and one more is to be added.

The Bureau has been working on problems with respect to weight law changes and it was pointed out that producers' profits per cu. yd. of concrete have increased materially with increases in rated capacity of mixers.

Some states have changed their weight laws, he said, in anticipation of the possibility of passing a federal law in connection with highway building that would stipulate that state weight laws remain as they are at the time. The Bureau is continuing to work on weight distribution and will soon have available a "weight visualizer" for the quick calculation of payload and distribution to the front axles of trucks.

Joint Board Meeting

The joint session of the two boards gave emphasis to the annual conventions of the two associations to be held at the Conrad Hilton Hotel, Chicago, Ill., February 13-16. For the first time, the machinery exposition will be held outside the convention hotel and it will be that week at the Chicago Coliseum.

V. P. Ahearn outlined the general arrangements. There will be a comptrollers conference on Monday and convention sessions will be on Tuesday, Wednesday and Thursday. A conference of state and area associations is also on the agenda. He urged that there be a good turnout of operating men to inspect the exposition.

A. C. Thomas, The Jaeger Machine Co., in reporting on the biennial show, said that space will have to be rationed in spite of more than tripling exhibit facilities. The show will be open all day throughout the conventions and an innovation will be one evening session.

A record-breaking attendance is expected, to exceed by far the 4800 registering for the conventions and show in 1954, according to Mr. Ahearn. The 1958 convention and exposition are scheduled for the Conrad Hilton Hotel and the Chicago Coliseum, and the 1960 and 1962 arrangements are tentatively for the same locations. Conventions for the two associations in non-exhibit years are scheduled for Los Angeles in 1957 and New Orleans in 1959. Location for the 1956 Fall meetings of the two boards is yet to be decided.

Ezra C. Knowlton reported on his testimony before the House Public Works Committee on the president's highway program, and there was discussion of policy matters inasmuch as Mr. Knowlton is expected to appear before congressional committees in 1956 upon reintroduction of the expanded highway program.

Mr. Knowlton's report was very thorough and was supported by a number of wall-mounted charts which he had prepared to show scope of the program, financing and other details. He said that federal aid amounted to only 12.2 percent of highway funds in 1954 and will continue to be a minor part of the total for fiscal 1956 and 1957. Administrative machinery for highways is complicated, he said, and thousands of taxing units are involved. Any radical changes in taxing policy and administration are complicating and such proposals were responsible for failure of the bill to pass.

The expanded highway program became mixed up in politics, with special interests involved, and proposals made have threatened to invade the sovereignty of the States. Mr. Knowlton is not optimistic about the fate of the program in the next Congress. One reason is that the governors are not enthusiastic on tax increase, and many take the position that they do not want their states to be taxed to furnish funds for interstate road-building in other states when such roads are not in their own areas. There is some opposition from farm groups and also from truck operators and certain union groups.

It is unlikely, said Mr. Knowlton, that a special highway financing board will be created, and the bond issue proposal for financing outside the treasury is unlikely to be adopted. A 10-year federal aid program authorization may be passed instead of the usual 2-year authorization.

The two associations have gone on record as to their position. Through Mr. Knowlton they have urged a stepped up interstate and federal primary and secondary road system. Financing would be from the federal treasury under regular budgetary control. It has been suggested by the two associations that federal taxes be raised 50 percent from two to three cents per gal. of gasoline. The federal government's share would be 90 percent on the interstate system, and federal funds would be apportioned on the basis of need for the primary-secondary road system. Congressional review would be done annually. The associations are opposed to any authorization bill encroaching on state sovereignty and believe that nothing should be said in bill about diversion of funds.

Mr. Knowlton's report was so thorough and informative that he was invited by the boards to make the same presentation before the 1956 annual conventions in Chicago. His resolutions as to the association's position were accepted.

Research

Director of engineering Stanton Walker discussed the facilities of the two associations for research at the University of Maryland and the arrangement with the university. He detailed newer researches underway.

Depreciation

The joint committee on depreciation practices presented the detailed results of a depreciation survey made for both the sand and gravel and ready-mixed concrete industries. The report summarized methods of depreciation used before January 1, 1954, and subsequently, by numbers of companies, and tabulated the average useful life of equipment types and structures as used in tax returns according to the years and numbers of companies replying to the questionnaires.

Labor Legislation

In discussing labor matters, V. P. Ahearn said that the $1 minimum wage, effective March 1, 1956, for employes subject to the Wage and Hour Law may have the effect of pressuring to raise rates for other classifications.

Resolutions of policy on the following subjects were considered. If an employer agrees, under pressure of the Teamsters Union, to support secondary boycotts that becomes legal, said Mr. Ahearn, even though secondary boycotts are illegal under the Taft-Hartley Law.

Thusfar, effort of the Teamsters Union to require employers to agree to area contracts which supersede individual or group bargaining agreements in the two industries has not been acceded to by any companies.

The Taft-Hartley Act is not likely to be amended unless in welfare provisions. Mr. Ahearn said that if a company agrees on welfare deals that it accepts trustee repsonsibilities. Copies of resolutions as to the industries' stand on these three labor matters are to be sent the members for reading.

Group Insurance

A progress report on the N.R.M.C.A.-N.S.G.A. group insurance plan indicated its growing acceptance. Since the first of the year eight companies, with 78 insured employes, have joined the plan and additional companies are planning to join. Effective July 1, 1955, the plan was made available to members in Oklahoma, Ohio and Texas, permissible through recent interpretations by the state insurance commissioners of the three states.

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INDUSTRIAL SAND

(Continued from page 110)

voted that a letter be sent the Association of American Railroads to the effect the industry is not getting its fair share of such cars. Shortages of box cars and gondolas exist in some areas as well.

Comments were heard on sand reclamation practices in foundries and apparently the benefits which many foundries expected are not proving out. Some are scrapping their sand reclaiming equipment. However, the situation is a threat in some areas.

It was decided that the association continue to voice objection to H. R. 4579, a bill introduced in Congress that would remove duty on crude silica coming into Washington State from Canadian sources. The proposed change was for the purpose of enabling a Washington producer, who had exhausted his supply, to import crude silica from British Columbia. Action was taken due to the competitive threat that might result elsewhere from outside the United States.

Executive secretary V. P. Ahearn, in his informal talk on the Washington scene, summarized accomplishments of the last Congress, discussed some of the major problems in Washington and made some political predictions.

President Eisenhower, while he lost out on some important administrative goals, had considerable success with a democratic congress in Mr. Ahearn's opinion. One of the major problems to be faced will be whether taxes be cut or deferred in the interests of balancing the budget which economists consider the utmost importance. Defense spending has been trimmed by the administration from $50 billion to $39 billion annually and other major budgetary items can hardly be reduced to permit any sizable cut in taxes, said Mr. Ahearn. There will be a political fight on this, he predicted.

He believes that congress will act to expand social security and that more spending for drought and flood relief and for highway building will pass. This would take care of the $2½ billion surplus in the federal budget.

The democrats expect to win the 1956 elections and it will take more than the president's popularity to win, should he run for re-election. Declining farm income will handicap the republicans whereas the decline in major labor strikes will help the republicans.

Should President Eisenhower choose not to run, it was predicted that vice-president Nixon would not be nominated. The party seems to prefer Senator Knowland.

Adlai Stevenson seems the most popular choice for the democratic party even though many criticize him as being too much of an intellectual. The campaign of the republican party will be waged around the continued prosperity of the nation but, said Mr. Ahearn, the republicans will have to get the independent vote in order to win. There will be 32 senators up for election in 1956 and the entire house of representatives, with the prospect of increased democratic control.

The mobilization of labor power backed by money is a serious threat in the future, he said. The unlimited right to strike could well encompass other groups than labor. Doctors and lawyers have already banded together for strike purposes in other nations.

One of the most serious problems is that of enlisting qualified people for government service both in the United States and in the foreign service.

Equipment Distributors to Meet

ASSOCIATED EQUIPMENT DEALERS, the national trade association of the construction equipment industry, will hold its 37th annual meeting January 29 through February 2, 1956, at the Conrad Hilton Hotel, Chicago, Ill. More than 3000 distributors and manufacturers of construction equipment are expected to attend.

Modern Materials Handling

Newest limestone plant specifies . . . .

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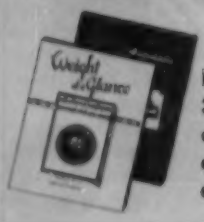
Presque Isle Corp., Presque Isle, Michigan, is expected to ship 4¼ million tons of high calcium limestone in its first year of operation. Automatic blending with belt conveyors is accomplished by means of individual Merrick Weightometers operating in conjunction with a Speedomax control and recording device. This special automatic arrangement of proportional control is one of unique Merrick conception providing a wide latitude in blended formulae. In addition to two Weightometers installed at the dock, there are seven other Weightometers making a total of 9 in all at this plant. One Weightometer is mounted on the primary belt conveyor and records quarry production in tons per hours, while one Weightometer is installed on each of the stockpiling belt conveyors.

Weightometers can serve you, as they have faithfully served thousands of producers for the past 45 years. Each Weightometer is designed and built specifically for your requirements, and in each instance will give you continuous and automatic integration and totalization by weight of material carried in your conveyor.



Bulletins 375 and 253 covering this equipment are available on request

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Now full protection without loss of accessibility

All parts, including slip rings and leads, are enclosed — yet removable inspection covers and end-shield sections simplify maintenance.

These motors combine modern functional design with maximum protection and accessibility.

Here are some of the important features:

- Collectors and brushes are protected by box-type stator yoke from physical damage, dripping moisture, dust and dirt.
- Cast end shields provide rigid bearing support and full protection for motor windings.
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Note accessibility offered by generous size opening covers. Upper half of end shield is removable for entrance to motor winding.

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FLUID PETROLEUM

(Continued from page 103)

Samples of clinker were taken during the run which were analyzed as follows:

	Control Percent	Test Percent
SO_3	0.027	0.084
Free CaO	0.126	0.060
Ignition Loss	0.090	0.000

The laboratory advised that these clinker samples appeared normal and analyzed as such.

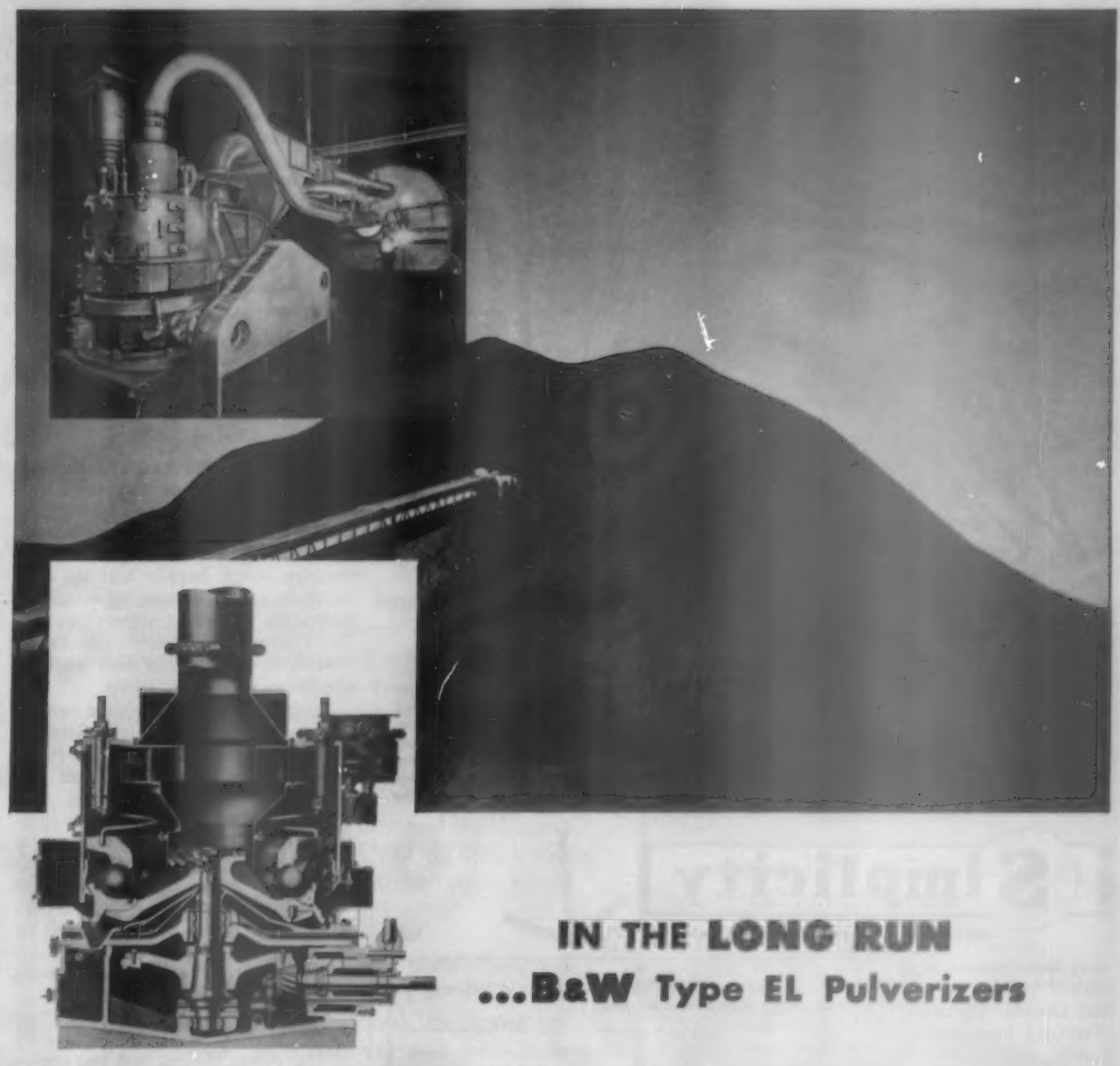
The bulk of the sampling and testing was conducted at the back end of the kiln, directed toward analyzing the kiln effluent with particular reference to the sulfur content and its accompanying dangers of air pollution. An iso-kinetic probe, similar to a pitot tube, was used to take centerline gas and dust samples. The gas samples were analyzed by a Mine Safety Appliance Co. H_2S detector, essentially a glass tube with a reagent coating of silver cyanide on aluminum oxide granules. The concentration of H_2S determined by four tests of the M.S.A. detector showed 0.0003 percent by volume on a dry gas basis.

A paper thimble was used to collect effluent dust. Sulfur compounds in the dust are in the form of both sulphate (calcium sulphate) at 16 percent and sulphite (sodium potassium sulphite) at 84 percent. Based on a rate of flow of 34.4 t.p.d. and corrected for the control run, the analysis ran 0.97 percent S and was equivalent to 27.4 lb. per hr. of sulfur.

The total sulfur in the gas (H_2S and SO_2) collected in a Na_2CO_3 solution and condenser water computed at 185,000 c.f.m. at 480 deg. F. and corrected for the control run, was determined to be 33.2 lb. per hr. It was concluded from the test that the SO_2 in the gases of combustion reacts with the alkaline in the slurry feed, resulting in the appearance of sulfur compounds both in the clinker and the dust collected by the precipitators.

From the test data and observations, it would appear that if all five kilns of this plant were operating wholly on fluid coke, the total sulfur released to the atmosphere would probably be on the safe side, or not objectionable, assuming there is a 50-50 split of the sulfur being found in the stack gases and in the dust collected by the precipitators. The amount of sulfur found in the clinker was insignificant. Any reduction of the total coke burned or a reduction of sulfur below the 6 percent analysis of this sample would minimize the air pollution problem.

It may be concluded that fluid coke is a fuel that with proper handling and design of facilities can be burned with good combustion characteristics.



IN THE LONG RUN
...B&W Type EL Pulverizers

Wherever these "extended engagement" pulverizers are used for direct-firing of rotary kilns they have established long and impressive performance records.

BECAUSE:

1. Grinding zone has no bearings or parts to be lubricated.
2. No internal adjustments are required.
3. Grinding elements are made of wear-resistant, long-life metals, with grinding balls held to close spherical tolerances.
4. Fully-enclosed reduction gear drive, with anti-friction bearings, and integral pump for automatic pressure lubrication.
5. Tramp iron and pyrites are automatically rejected, usually without interruption of service.

These qualities plus many years of manufacture and application combine to give you constant, high-level service for modern kiln operation. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX
BOILER DIVISION

C-312

This informative 8-page catalog gives you all the facts, saves you time and money in getting Woven Wire Screens for *immediate delivery!*

Here's a catalog that tells you quickly all you'll need to know in ordering woven wire screens. Tough Industrial Simplicity Screen Cloth in a wide choice of gauges and openings is available from stocks at Durand, Michigan. This catalog lists all the sizes in simple, quick-reading chart form for your convenience. A minute's glance will give you all the ordering information you desire, such as width of opening, diameter of wire, decimal opening, and % area open, together with the sheet sizes in stock. A really concise and useful catalog! Send coupon below now for your free copy.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND 13, MICHIGAN

163

Sales Representatives in all parts of the U.S.A.
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Please send me the catalog of your stocks of high-grade Simplicity Woven Wire Screens. ☐
MY NAME _____ TITLE _____
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CITY _____ STATE _____
Please send your catalog No. 53, Screens, Feeders and Conveyors, also. ☐

Have You Seen the AGIPELLER*?

NEW!
INCREASES OUTPUT!
CUTS COSTS!

THIS SUCTION DREDGE AGITATOR (Pat. Pend.) keeps nozzle clean, loosens compacted deposits, crushes oversized stones. Pays for itself quickly. Write for free bulletin. *Trade mark

W. H. PFARRER CO., 211A W. Wacker Dr., Chicago, Ill.
Dredge and Pump Engineers

ROCK PRODUCTS FEATURES TIMELY INDUSTRY NEWS EACH ISSUE

SILICA BRICK

(Continued from page 77)

into several size fractions as dictated by the particular mix required. The sized material is distributed by rubber lined chutes or conveyors to the various compartments of the ground material bins. A portion of this material is fed to a ball mill by means of a constant weight feeder for fine grinding. The ball mill is controlled by an electric ear and delivers its material to the fine ground material bins.

The dry pan, ball mill and material handling equipment are completely enclosed and connected to a bag-type dust collector.

Batching—Mixing

Two identical batching systems control the proportion of materials being readied for the mixing cycle. The coarser materials are withdrawn from the bins through cut-off gates into a sensitive weigh hopper and the fine materials are withdrawn by means of electrically operated rotary valves. This system is completely enclosed for control of dust and for best working conditions.

From the weigh hoppers the various materials are introduced into two mixing pans of modern design 9 ft. in diameter, having a rotating pan and stationary mullers and scrapers. The sequence of feed to the pans is carefully controlled and the mixing time is very important in proper preparation of the material for molding. At the end of the mixing cycle, the contents of the mixers are discharged by means of disc emptiers into skip hoists which deliver the material to receiving hoppers above the presses.

Pressing—Drying

The power presses and the impact press may be fed either automatically or manually by means of carefully controlled reversible belt feeders from the skip hoist hoppers. It is possible by means of this system to feed the Vega or Star material used to any or all of the presses. A separate hopper over each press is of sufficient capacity to receive more than a skip hoist load, thus allowing the mixes to be changed during operations. This hopper feeds each press by means of a belt feeder controlled by the quantity of material in a weigh hopper above the presses.

The pressed brick are delivered from the press by means of standard pushers or by mechanical pickers. The operator transfers the brick from the press to rack cars which in turn are handled by lift truck operators to and from the rack car dryers.

The rack cars loaded with brick are

(Continued on page 124)

The LINE forms on the RIGHT!

For these NEW PAYLOADER® tractor shovels

We anticipated some of this demand....

But apparently not enough. . . .

We're increasing our production....

We're expanding our facilities. . . .

However, since these new models outproduce and outperform other tractor-shovels, we expect the demand to increase even more. If you are interested in more production at lower costs, your future needs will probably include one or more of these new "PAYLOADER" models.

Because of the current demand we suggest you contact your "PAYLOADER" distributor *at once* and discuss your needs with him.

These new models have been designed and are being built by The Frank G. Hough Co. who introduced the first four-wheel-drive tractor-shovel and who have produced more unit-design tractor-shovels than all other firms put together.

model HU 1 cu. yd.

model HH 1½ cu. yd.

model HO 2 cu. yd.

The complete proven "PAYLOADER" line of tractor-shovels includes sizes ranging from 18 cu. ft. to 2 cu. yd. bucket capacity and available in four wheel drive, rear wheel drive and front wheel drive types. They are sold and serviced by the largest, most experienced Distributor organization in the business.

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THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER"
☐ model HU ☐ model HH ☐ model HO

Name.....
Title.....
Firm.....
Street.....
City.....
State.....

American HAMMERMILLS
OFFER . . .
"AC5 Series"
Made in 4 sizes and two types. Capacity to 250 T. P. H.
Front Feed — For minimum of fines.
Center Feed — For maximum of fines. (Illustrated at left)
. . . A Size for Every Tonnage
"30 Series"
Made in 4 sizes. Capacity up to 100 T.P.H.
. . . from Roadstone to Agstone
"24 Series"
Made in 4 sizes. Capacity up to 50 T. P. H.
Write for Bulletin—"Better Stone Crushing"
American PULVERIZER COMPANY
Designers and Manufacturers of Ring Crushers and Pulverizers
1245 Macklind Ave.
St. Louis 10, Mo.

introduced into a dryer containing six tracks having 125 ft. overall length. After a car is placed in the dryer the train of cars is pushed hydraulically. The movement of cars through the dryer is in accordance with a carefully predetermined schedule. The dryer is supplied with clean hot air from the cooling zone of the kiln and a system of fans and ducts is arranged to insure a uniform movement of warm air throughout the complete cross-section of the six tracks. Both indicating and recording instruments are used to observe the temperature and humidity conditions throughout the length of the dryer.

Tunnel Kiln

This tunnel kiln is the seventh tunnel kiln built by Harbison-Walker for the burning of silica brick and is the 29th tunnel kiln to be put into operation in all the company's plants. It was completely designed by Harbison-Walker's engineering staff. The Leslie kiln is 504 ft. long, holds 61 cars and has a load cross-section of 5 ft. x 8 ft. The cars are pushed through the kiln continuously.

The kiln is equipped to burn heavy or Bunker C oil. The oil is heated by means of high pressure steam in the oil tanks and the oil lines are traced throughout the system by means of steam lines which are wrapped together and insulated. Hot air at approximately 700 deg. F. is delivered to the burners from the cooling zone of the kiln for combustion.

Groups of burners are zoned to allow for ready adjustment. The burners are designed to burn steam atomized Bunker C oil or air atomized No. 2 fuel oil. All of the air entering the burners must pass through the burner as the units are completely sealed against the introduction of free air from the room or the leakage of hot gases from the kiln if the kiln is being pressure fired.

For use in start-ups and for rapid recovery from work stoppages, the kiln and boiler are completely equipped to burn No. 2 fuel oil contained in a 15,000 gal. standby tank.

The kiln is carefully insulated to prevent excessive heat loss through the walls and crown and the insulation is varied to suit the temperature in any section of the kiln and still maintain an outside surface temperature of less than 200 deg. F.

The entrance end of the kiln is equipped with a double door and vestibule system to prevent disturbance of the draft during the charging operation. The kiln is charged at regular intervals—24 hr. a day, 7 days a week.

Both thermocouple and radiomatic

(Continued on page 126)

Now... Amsco® Pumps built especially to handle abrasive mixtures

Wearing parts last longer because they're cast in HC-250 a special wear-resistant alloy

If you pump tailings, sand, taconite, cement mill slurry or any grinding, abrasive mixture... ordinary pumps don't stand a chance.

That's why Amsco now produces a type of pump with all wearing parts cast in an exceptionally abrasion-resistant metal. It's a special alloy called HC-250... now used in Amsco Pumps where extremely abrasive applications are encountered. HC-250 has an abrasion resistance unsurpassed except by expensive carbide insert or hardfacing materials.

Whether your application calls for a pump to withstand extreme abrasion or severe impact, or a combination in-between... Amsco produces a line to meet your requirements. And, in addition to the special wear-resistant metals, Amsco pumps are compactly designed to save on labor costs when repairs are needed. Their simple design means fewer parts to wear out... fewer man-hours needed to disassemble and assemble an Amsco pump.

So, for trouble-free pump service, ask an Amsco pump specialist for a recommendation. He'll analyze your requirements and recommend the type of Amsco pump best suited for your application. Standard-size Amsco pumps range from 6" to 16" discharge openings. Larger sizes are also available. Write for Bulletin No. 548 IP which gives specifications and complete data on the Amsco pump line.

Amsco also manufactures a complete line of hardfacing welding equipment... both rods and machines.

AMERICAN Brake Shoe COMPANY

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HEAVY-DUTY GRINDING
from
Alumina
to
Zircon

Patterson
BALL & TUBE MILLS

BUILT TO WITHSTAND THE MOST SEVERE PUNISHMENT IN SERVICE—Readily adaptable to fine or coarse grinding, wet or dry grinding, open or closed circuit grinding. Used successfully by the metal mining industry throughout the world.

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The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada

SILICA BRICK

(Continued from page 124)

instruments are provided for measuring temperatures. These recording and direct reading instruments provide the information which permits the operator to set up any desired burning curve, and by adjustment of individual burners to secure uniform heating and cooling conditions throughout the length of the kiln.

Both the tunnel kiln cars containing unfired or green brick and those containing burned brick are handled throughout the plant by means of transfer decks and electrically driven locomotives. These d-c driven units allow for speed variations within the widest possible practical limits.

The tunnel kiln cars containing the burned brick are delivered to unloading stations adjacent to the stock shed and the brick are unloaded at this point onto pallets handled by lift trucks. Through careful planning, the one-level plant provides for lift truck travel throughout, and permits easy handling of the palletized brick into storage, or delivery into railroad cars or trucks.

Dust Control and Collection

As in all of the Harbison-Walker modern silica brick plants, special attention has been paid to dust control. All of the equipment is completely enclosed and connected to a modern cloth bag-type collecting system which in turn discharges the dust into the ball mill fines bin. In addition, both for noise control and dust control, the grinding department is completely enclosed.

It is planned to install adequate high vacuum portable units for general and spot clean-up throughout the operation.

During the firing of silica brick, a permanent increase in dimensions occurs, amounting to about 15 percent by volume. The expansion results from the transformation of the silica mineral quartz into other crystalline forms of silica. The completion and control of this expansion, without damage to the ware, requires extended time as well as careful temperature control, and this is the primary reason for the great length of the tunnel kilns in which silica brick are fired.

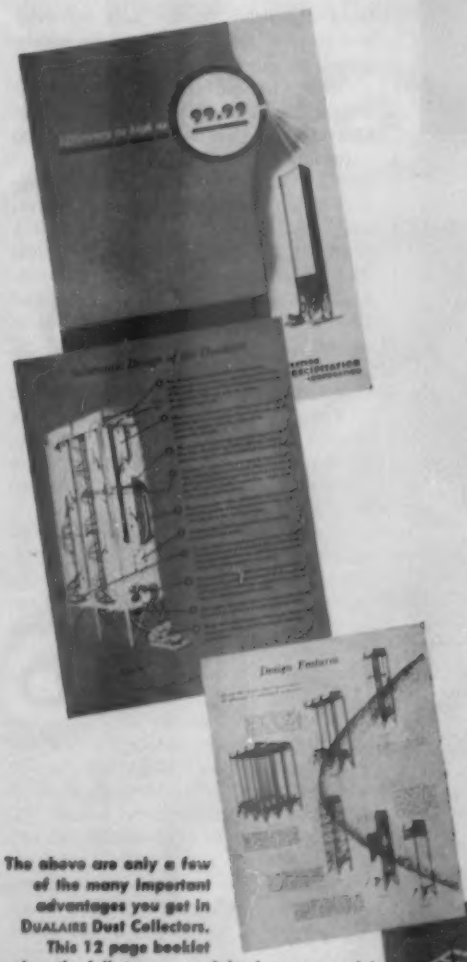
At all stages of the manufacturing process, samples are regularly taken for immediate testing in the quality control laboratory. The brick are tested at the plant by competent laboratory technicians with complete laboratory facilities, and additional tests are conducted regularly at the company's central research laboratory at Hays, Pittsburgh, Penn. It was at this labo-

The latest advancement in dust recovery

Dualaire*

REVERSE-JET DUST COLLECTOR!

- *Cleans without jarring or rapping!*
- *Maintains uniformly low pressure drop!*
- *Field-proven efficiency as high as 99.99%!*



Backed by the same organization that pioneered commercial application of COTTRELL Precipitators and MULTICLONE Collectors, the DUALAIRE Reverse-Jet Dust Collector is revolutionizing filter-type recovery systems. The DUALAIRE gives you vital advantages like these . . .

REVERSE-JET CLEANING ACTION cleans the filter tube continuously in small increments—not with sudden surges as in rapping or jarring.

CLEANING ACTION starts automatically and stops automatically to keep pressure differential within low pre-set range.

FILTER EFFICIENCY remains uniformly high at all times because no thick filter cake ever forms to reduce operation effectiveness. Actual field tests show efficiencies as high as 99.99%!

NO STANDBY UNITS, with their complicated switching devices, are needed. The DUALAIRE is cleaned as it filters—without interruptions or shut down periods for cleaning. The operation is continuous!

FILTER UNITS LAST LONGER because they are not subjected to intermittent jarring, rapping or vibration—all destructive to filter fabrics.

The above are only a few of the many important advantages you get in DUALAIRE Dust Collectors. This 12 page booklet gives the full story . . . explains how reverse-jet cleaning action works — shows how the basic DUALAIRE unit is adaptable to a wide range of operating requirements — provides facts, figures and illustrations that will change your thinking on filter-type recovery systems. Send for your free copy of this descriptive booklet — or see your nearest Western Precipitation representative!

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*"Dualaire" & "Multiclone" ®

Licensed by H. J. Harvey, Jr.

YUBA PLACER DREDGE DIGS, TREATS, STACKS 18,000 TONS GRAVEL DAILY...

This placer dredge with 18 cu. ft. buckets digs to 125' below water, averages better than 22 hours running time daily. Intricate treatment equipment on board limits digging to only 18,000 tons of gravel per day. For sand and gravel digging only, an 18 cu. ft. YUBA dredge can produce as much as 40,000 tons daily.

5¢ Per Ton

YUBA gold dredges or other bucket ladder dredges of this type can be converted to dig and screen sand and gravel at operating costs substantially under 5¢ a ton. Equipment for more extensive sizing, scrubbing or other separation processes can be installed to finish products at costs per ton comparable with the low costs on dredges used in the mining industry.

Another big advantage — YUBA dredges float in their own ponds and excavate gravel without lowering surrounding water levels.

Long Operating Life

With YUBA dredges you get both low production costs and long operating life—many YUBA dredges are operating efficiently after 25 years or more of rough service.

Consult YUBA NOW. We will design and build a new dredge to fit your ground; or help you find a used dredge, and move, redesign and rebuild it. Wire, write or call us—no obligation, of course.

Profusely illustrated, 40-page brochure, "YUBA Dredges," yours for the asking.

YUBA MANUFACTURING CO.

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AGENTS { DIXIE, DARBY & CO., LTD., SINGAPORE, KUALA LUMPUR, PENANG. SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3. CABLES: YUBAMAN, SAN FRANCISCO SHAWDARBCO, LONDON

63

ratory that the refractories industry's first spectrograph was operated for control of the alumina and alkali content of silica brick.

The extensive investigations of the McIntyre Research Foundation of Toronto, Canada, have been responsible for the wide-spread adoption of powdered-aluminum prophylaxis as a preventive for silicosis. Harbison-Walker was the first industrial organization of any kind in the United States to be licensed by the McIntyre Research Foundation to administer the treatments. This was at the Hays Works in 1943, and the aluminum prophylaxis program is also used at Leslie.

LABOR RELATIONS

(Continued from page 53)

lated character of the acts involved but also by the following facts established by the record:

"(1) On November 4, Crowder sought to dissuade Western Sand and Gravel from leasing trucks to Cisco with which to haul concrete.

"(2) On November 5, Crowder, before talking to Forcier as noted above, told the president of Cadman that a representative of Respondent Local 302 would visit the plant on November 8 to tell Forcier, who had applied for membership in that union, 'not to operate.'

"(3) On about November 11, another representative of Respondent 174 told a group of Cadman truck drivers that they could not go through, or that the union would not let them go through, the Respondent Carpenters' picket line at Cisco.

"(4) On about November 15, representatives of the Respondent Carpenters and Local 302 asked the president of Western Sand and Gravel not to deliver materials to Cisco 'because of the status of Cisco, a nonunion operator, in conjunction with the unions.'

"(5) On November 29, when Lucero attempted to induce Layrite employes not to load Cisco trucks he was accompanied by MacDonald, a representative of Respondent Local 302. On that occasion Lucero told the employes that if they were discharged for refusing to load the Cisco trucks 'the union would shut the plant down, and that they would call in the Teamsters.'

"(6) On November 29, a representative of Respondent Local 302 demanded of Layrite that it not sell materials to Cisco and, when this demand was rejected, threatened a picket line and other retaliatory action.

"These facts and the records as a whole make it plain that the operations of Cisco at Redmond and Young's

COMPARE ABILITY...COMPARE COST! CHOOSE THE BD-3 MOTOR GRADER

Outstanding Performance On All Types of Jobs The Allis-Chalmers BD-3 is a *quality* motor grader — with such features as tandem drive for maximum traction; exclusive ROLL-AWAY moldboard that efficiently rolls the load instead of pushing it; high axle and throat clearance to clear large windrows; husky tubular steel frame that absorbs stresses and strains. In addition, the BD-3 has the right combination of weight, power and traction to do outstanding work on a wide variety of motor grader jobs.

Economical to Own and Operate. The BD-3's economy begins with its purchase price. You are invited to compare this with the cost of other graders in its class. Compare also what you get for your money. The modern engineering, quality materials and precision workmanship in the BD-3 are your assurance of long-life dependability.

ROLL-AWAY is an Allis-Chalmers trademark

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

78 brake hp — 19,220 lb
6 forward speeds to 18.5 mph
3 reverse speeds to 6.3 mph

ALLIS-CHALMERS

you can grind Specification Sands

for less than 25¢ per ton

with

MARCY* CPD MILLS

One of two 8'x 12' Marcy Center Peripheral Discharge Rod Mills producing specification sands on dam job in Oregon.

AND GET ALL THESE ADVANTAGES

- **low cost** . . . maintenance is low—overall cost of mill operation, exclusive of amortization, is generally less than 25c per ton.
- **flexibility** . . . by varying rate of feed, pulp dilution and discharge port area it is possible to change gradation of finished product to meet different specifications.
- **better product** . . . feed enters both ends, discharges at center. Material moves rapidly through mill, and cubical shaped particles are produced with a minimum of fines.
- **wet or dry grinding**
- **capacities from 2 to 200 dry tons per hour.**

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Lake on a non-union basis were a matter of concern to all the Respondents and that Respondent Carpenters' activity against Cisco and the action taken by the other Respondents, whose manifest purpose was to implement and further the effectiveness of Respondent Carpenters' activity, were all directed toward the same end; namely, to secure the unionization of Cisco employes. In this matter, we find, the Respondents were not acting as strangers to one another, but rather were engaged in a joint course of action to accomplish their common purpose. Under well-established principles, this joint venture relationship between the Respondents carried with it responsibility by the Respondents for each others' acts."

"Order: Seattle District Council of Carpenters; Local Union No. 174, Teamsters; Local 302, Operating Engineers; and Local 440, Hod Carriers; all AFL, shall cease and desist from engaging in unlawful secondary boycott. Post notices."

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946. (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF ROCK PRODUCTS, published monthly at Chicago, Ill., for October 1, 1955.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher — Maclean-Hunter Publishing Corp., 309 W. Jackson Blvd., Chicago 6, Ill.
Editor—Bror Nordberg, 309 W. Jackson Blvd., Chicago 6, Ill.
Managing Editor—Ralph S. Torgerson.
Business Manager—P. D. Allen, 309 W. Jackson Blvd., Chicago 6, Ill.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Maclean-Hunter Publishing Corp., 309 W. Jackson Blvd., Chicago 6, Ill. The stockholders of the Maclean-Hunter Publishing Corp. are P. D. Allen, 255 Locust Rd., Winnetka, Ill.; R. K. Davis, 548 W. 58th St., Hinsdale, Ill.; F. S. Chalmers, 86 Chestnut Park, Toronto, Ont., Canada; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ont., Canada; Maclean-Hunter Publishing Co., Ltd., 481 University Ave., Toronto, Ont., Canada.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which the stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.) . . .

P. D. Allen
Business Manager

Sworn to and subscribed before me this 22nd day of September, 1955
[SEAL]
Clara M. Brockschmidt
(My commission expires March 13, 1956.)

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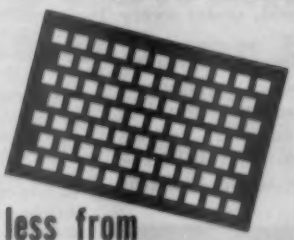

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A racking arrangement moves the drilling unit forward or backward, when driving casing or pulling rods, without changing the position of the sheave wheel on the derrick with relation to the drill hole. Standard single-pole derrick permits pulling rods or casings up to 10 ft. in length. Modern simplified design includes convenient controls, 3-speed transmission, machine-cut alloy-steel gears, anti-friction bearings and other improved features to assure low-cost trouble-free operation.

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For jobs not easily accessible by truck or trailer.

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For more than seventy years Sprague & Henwood, Inc., has been a leader in the field of Contract Diamond Drilling and Soil Sampling. During this long period of time our crews have completed thousands of contracts successfully, in almost every part of the world, under every conceivable operating condition.

Today we have a large force of expert operators and an ample supply of modern equipment, so that we can undertake practically any job, anywhere, on short notice. Inquiries for all types of contract drilling work are solicited — estimates submitted promptly without charge or obligation.

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ROCK PRODUCTS
THE
Recognized Authority
OF THE
Non-Metallic
Minerals Industry

MANUFACTURERS NEWS

Westinghouse Electric Corp., Pittsburgh, Penn., announces that Gwilym A. Price has been elected chairman of the board in addition to his duties as president and chief executive officer. Mark W. Cresap, Jr., has been named executive vice-president and deputy chief executive officer; Latham E. Osborne, vice-chairman of the board; John K. Hodnette, who is a member of the board, vice-president and general manager of all product groups; A. C. Monteith, vice-president in charge of basic electrical equipment for utility and industrial applications; and Dr. John A. Hutcheson, vice-president in charge of engineering and research.

Dorr-Oliver, Inc., Stamford, Conn., has announced the sudden death on August 28 of Edwin Letts Oliver, founder and chairman of the board. He was 77 years old. Well known for his work in the field of continuous filtration, Mr. Oliver in 1907 developed the Oliver continuous filter which was the cornerstone of the Oliver Continuous Filter Co. founded by him in 1910. The firm of Oliver United Filters, Inc., was formed in 1928 and Mr. Oliver served as president until 1954 when it merged with The Dorr Co. to form Dorr-Oliver, Inc. Among the many honors conferred on him were the James Douglas Medal of the A.I.M.E. and the degree of LL.D. by the University of California in 1945.

Edwin Letts Oliver

Drave Corp., Pittsburgh, Penn., announces the election of William E. Clark as executive vice-president to succeed Alex W. Dann, who has retired after 43 years of service. Mr. Clark was formerly vice-president and general manager of the engineering works division.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has established six major operating divisions, each headed by a general manager, three of which will be in the industries group, formerly known as the general machinery division, and three in the tractor group, formerly the tractor division. J. L. Singleton will head the industries group and W. G. Scholl will head the tractor group.

Huber-Warco Co., Marion, Ohio, has appointed the following distributors: Hobbs Equipment Co., Tyler, Texas, in eastern Texas; Hodge & Hammond, Inc., New York, N. Y., in greater New York City and a few surrounding counties; McNall Machinery & Supply Corp., Cedar Rapids, Iowa; and Ruffridge-Johnson Equipment Co., Inc., Minneapolis, Minn.

Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio, has appointed the Hawkeye Machinery Co., Inc., Des Moines, Iowa, as distributor in central and eastern portion of Iowa, and Bert Smith Road Machinery Co., Inc., Enid, Okla., as distributor in the state of Oklahoma with the exception of six extreme eastern counties.

Chain Belt Co., Milwaukee, Wis., has announced the appointment of Richard M. Lock as assistant sales manager of the construction machinery division. He was formerly mid-Atlantic district manager at Philadelphia, and will be succeeded by Ken Klabunde, who has been serving as field service engineer for the eastern district office in New York.

Hudson Pulp & Paper Corp., New York, N. Y., announces that T. T. Collins, Jr., has been appointed technical director with headquarters in Palatka, Fla. A. W. Aron has been named

2¼-yd. MICHIGAN 175A carrying full load low up a grade . . .

This big POWERHOUSE handles bigger jobs cheaper!

Check the specs of the MICHIGAN* 175A:

BUCKET CAPACITY.....2¼ yds.
WEIGHT.....24,100 lbs.
LIFTING CAPACITY.....15,000 lbs.
SPEED..Up to 27 mph, Forward and Reverse
HORSEPOWER.....133 Diesel, 126 Gas, 165 Supercharged

Don't look for "comparative" data on the MICHIGAN 175A—there is *no machine comparable*. This big bruiser is nearly 50% bigger than the next closest machine on the market. From flywheel to bucket, the 175A is built to do bigger, heavier jobs—jobs that no other rubber-tired machine can handle.

Better traction and flotation With the MICHIGAN's exclusive power train—300% torque multiplication, power shift transmission (no engine clutch) and planetary wheel axles—you get a shockless flow of power right down to the ground. There's no surge, no wind-up in the axle shaft, no wild wheel-spin. The operator has feather-touch control over his wheels; in weak soil conditions or mud, he can ease off or step up the power to keep from digging in. With this kind of smooth power transmission, you get the full advantage of the MICHIGAN's extra weight and power—you dig material *out*, you don't dig the machine *in*.

Hydraulic power does the work In spite of its size and power, the MICHIGAN 175A is easier to operate than most machines one-third its size. Hydraulic power does all the real work: power steering, 4-wheel power brakes, power-shifting with two simple levers on the steering column, no clutch pedal.

See it in action! We'll prove that the MICHIGAN is in a class by itself in the Tractor Shovel field: your local MICHIGAN distributor will arrange a demonstration—on your own job, if you wish. Or write for 12-page Tractor Shovel booklet containing explanation and cutaway drawings of the MICHIGAN power train. Any MICHIGAN is available on a low-cost Lease Plan—ask for brochure which explains how you can use it.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
452 Second Street
Benton Harbor 30, Michigan
Phone WA 6-6184

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- VIBRATING SCREENS- *All sizes and types*
- UNILEC HEATING EQUIPMENT
- UNIFLEX VIBRATORS
- UNIVIBE RIDDLES

WRITE FOR CATALOG NO. 150

UNIVERSAL VIBRATING SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

vice-president in charge of the industrial products division, and Julian Mendelsohn has been made vice-president in charge of the multiwall division, in addition to their duties as sales managers of their respective divisions in the company.

Soiltest, Inc., Chicago, Ill., has moved its offices and plant to 4711 W. North Avenue.

Gorman-Rupp Co., Mansfield, Ohio, has appointed Robert L. Sears as south-central district representative in the lower Mississippi Valley and Delta areas, with headquarters in Memphis, Tenn.

International Harvester Co., Chicago, Ill., has appointed Metalweld, Inc., Philadelphia, Penn., as a distributor in the Philadelphia area, and Keresni Tractor & Equipment Co., Casper, Wyo., as distributor in Wyoming.

Bucyrus-Erie Co., South Milwaukee, Wis., has announced the appointment of R. J. Fyfe Equipment, Ltd., Regina, Saskatchewan, Canada, as distributor for the Province of Saskatchewan, and Euclid-Memphis Sales, Inc., Memphis, Tenn., as distributor in western Tennessee, northern Mississippi and northeastern Arkansas.

Cleaver-Brooks Co., Milwaukee, Wis., announces the appointment of the Dykes Co., Shreveport, La., as distributor in northern Louisiana, northeast Texas and southwest Arkansas.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., has started construction of a $4,000,000 plant in Columbiana, Ohio, for production of high temperature basic refractory brick for the cement, steel, glass and copper industries. The project is expected to be completed by late Spring, 1956.

Industrial Brownhoist Corp., Bay City, Mich., has announced the election of Max Riebenack, III, as president of the company. He has been with the firm for 30 years, starting as district sales engineer in Philadelphia and advancing to vice-president in charge of sales and advertising and then executive vice-president. Stanley R. See, formerly director of sales for the eastern region, has been named vice-president and assistant to the president.

Frank D. Davis Co., Los Angeles, Calif., manufacturers of colors for concrete masonry units, has opened a plant, warehouse and sales office in New Brunswick, N. J., under the management of Paul Raber, with Frank D. Davis as general manager.

H. K. Porter Co., Inc., New York, N. Y., announces that Paul Duncan has been appointed Washington, D. C., representative for the firm and its 13 divisions, with offices at 724 Fourteenth St., N. W.

Galion Allsteel Body Co., Galion, Ohio, has announced the appointment of South Texas Truck Equipment Co., Inc., Houston, Texas, as distributor in the Houston area.

Lippmann Engineering Works, Milwaukee, Wis., announces the appointment of Jerome M. Kostus as sales representative in New Jersey, eastern Pennsylvania and southeastern New York State including New York City.

Bemis Bro. Bag Co., St. Louis, Mo., announces that F. B. Bemis, president, has been re-elected a board member of the National Industrial Conference Board.

The White Motor Co., Cleveland, Ohio, has acquired the property, business, inventory and other assets of the diesel engine division of The National Supply Co., Springfield, Ohio. William F. Burrows has been made general manager of the division.

Whiteman Mfg. Co., Los Angeles, Calif., has purchased the Concrete Equipment Mfg. Co., Inc., manufacturers of the Champion line of transit concrete mixers, which will continue to be produced at the company's plant in Los Angeles.

Straub Mfg. Co., Inc., Oakland, Calif., designers and builders of the Kue-Ken jaw and gyratory crushers, has moved into its new plant serving the western states of the United States, western Canada, Alaska, Mexico and Central and South America.

Clark Equipment Co., Buchanan, Mich., announces that C. H. King, vice-president in charge of the automotive division, and D. H. Ross, assistant to the president, have been elected to the board of directors, increasing the number of directors from 15 to 17.

Harbison-Walker Refractories Co., Pittsburgh, Penn., has announced the appointment of Richard S. Moore as general sales manager. He has been assistant general sales manager since 1953.

Cummins Engine Co., Inc., Columbus, Ind., has appointed Cummins Carolina Diesel, Inc., Charlotte, N. C., as distributor in South Carolina and the southwestern portion of North Carolina.

Pangborn Corp., Hagerstown, Md., has announced the promotion of Arthur J. Buckley from assistant sales manager to sales manager.

Kraft Bag Corp., New York, N. Y., has appointed John P. Witter as sales representative in North Carolina, South Carolina and Virginia, with headquarters at Charlotte, N. C.

Clark Equipment Co., Jackson, Mich., announces the appointment of Roger W. Robinson as sales manager for the transmission division.

Mid-Western Industries, Inc., Wichita, Kan., has announced a sales agreement with Massey-Harris-Ferguson, Inc., whereby the Davis front-end tractor loaders and back-hoes, designed and manufactured for Ferguson and Massey-Harris

THOUSANDS DEPEND UPON THIS NAGLE PUMP

IT NEVER FAILS THEM!

Nagle Pumps have long and ably handled sand, slurries, tailings, fly ash and drainage for aggregate producers, mines, power plants, and mills. The Nagle 10" type "T" centrifugal pump shown is helping to keep electricity flowing to thousands of homes, farms and factories. It is

on a dredge which keeps water intake screens free of sand, gravel and debris so that boilers of the Iowa Power & Light Co. at Des Moines, Ia., have an unlimited supply.

Just the job for Nagle Pumps, designed to not clog, to resist wear and to handle heavy loadings of solids. Simple slippage seal and bearing adjustments. Any part quickly replaced. A pump you swear by, not at. A size and type for every abusive job involving abrasion or corrosion.

SEND FOR CATALOG 5266

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REMINGTON INDUSTRIAL GUN Cuts $85.00 job to $9.50 at quarry

"It used to cost us about $85 each time we had to remove overhanging rocks from our quarry—now with a Remington Industrial Gun we do the whole job for $9.50." That's the report from a zinc mine in Alabama.

Savings like this are common. The Remington Industrial Gun saves hours of hazardous work . . . can be aimed, loaded and fired in seconds. Mount it on a truck, a tripod or a mobile chassis. Set it up in any part of your mine or quarry. You'll find real versatility in this fast, safe way of removing obstructions. The U.S. Bureau of Mines, for example, has used it for dislodging large icicles at distances *up to 200 yards!*

BEST WAY TO REMOVE KILN RINGS, TOO. A few well-placed shots with the Remington Industrial Gun loosen rings, cause them to fall when kiln is rotated. Minimum downtime! Big gains in production!

REMINGTON INDUSTRIAL SHELLS have tremendous smashing power. They're loaded with a powerful 3-ounce lead projectile that develops 7,475 foot-pounds' muzzle energy.

...SEND COUPON FOR FREE FOLDER.....

Industrial Sales Division R. P. 11
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Conn.

Please send me your free folder describing the Remington Industrial Gun.

Name_____ Position_____
Firm_____
Address_____
City_____ State_____

"If it's Remington—It's Right!"

Remington DUPONT

Here's WHY a Page Automatic Dragline Bucket IS YOUR BEST INVESTMENT

STARTS DIGGING FASTER. First pull on load line causes Bucket to dig in and start loading automatically.

FILLS MORE QUICKLY. Continued pulling loads bucket in only 1½ to 2 lengths.

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Page Automatic Dragline Buckets are guaranteed to out-perform any other bucket—size-for-size. Automatic digging action, high speed loading and ability to carry out full rated load every cycle mean more yardage and more profitable dragline operation. There's a Page Automatic made to meet every digging requirement. Sizes from ⅜ to 40 yds. and larger. Write for Bulletin GPB-454.

If it's a PAGE ... It DIGS

BF-3202

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Clearing Post Office, Chicago 38, Ill.

MECKUM *Material Handling Pumps*

★ Low initial & operating cost.

★ Engineered individually for hydraulic efficiency and simplicity of maintenance.

★ All wearing parts made of alloys to suit various types of materials pumped.

★ Ease of assembly of replacement parts reduces shut down time.

Another progressively engineered product. In sizes from 4" to 30".

Also manufacturers and suppliers of complete dredges, pipe, fittings and equipment necessary to efficient production of materials.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

tractors, will be merchandised and sold exclusively through Massey-Harris-Ferguson outlets in the United States.

Electric Storage Battery Co., Philadelphia, Penn., has appointed Warren Ingersoll as assistant to the president, his duties being in the field of customer relations. He was formerly assistant to the president of Lee Rubber & Tire Corp.

The Heil Co., Milwaukee, Wis., has appointed the following distributors: Teco, Inc., Jackson, Miss., in southeastern Mississippi, and the Bowyer Motor Co., Inc., Tucson, Ariz., in the states of Sonora, Sinaloa and Baja, Mexico.

John J. Yellen, Perth Amboy, N. J., has announced the appointment of Jack B. Hinkle as sales manager for the Yellen Hi-Speed block machines, with headquarters in Miami, Fla., where the machines are manufactured by the Miami Shipbuilding Corp. Mr. Hinkle has had many years' experience in the construction, heavy equipment and concrete block industries.

Jack B. Hinkle

Lamson & Sessions Co., Cleveland, Ohio, has acquired The Kent Machine Co., Cuyahoga Falls, Ohio, which will now be operated as a division of the company and will continue under the direction of the following personnel: H. T. Young, general manager; T. B. Daugherty, assistant secretary; Dan Urban, sales manager, concrete machinery; Robert Robinson, sales manager, special machinery; A. G. Walker, chief engineer; Robert Mariotta, assistant chief engineer; and Lee Pettit, purchasing agent.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of William A. Yost, Jr., as vice-president of staff operations directing activities in the industrial relations, public relations, legal, purchasing, comptroller and research divisions. He was formerly vice-president of the general machinery division.

Thermoid Co., Trenton, N. J., announces that Warren E. Hill has been elected president and a director to succeed George B. Fabel, who has retired. Mr. Hill was formerly executive vice-president and a director of Flax Corp.

Denver Equipment Co., Denver, Colo., announces that John F. Myers, international authority on flotation and grinding practices, has joined the company as consultant. He was formerly with Tennessee Copper Co. as superintendent of concentration.

Frank G. Hough Co., Libertyville, Ill., announces the appointment of Robert J. Sudlow as district representative for the New England states.

Cummins Engine Co., Inc., Columbus, Ind., has announced the appointment of B. C. Sears as regional manager of the Great Lakes region, with headquarters at Cleveland, Ohio. He was formerly regional manager of the Rocky Mountain region at Denver, Colo.

Remington Arms Co., Inc., Bridgeport, Conn., has announced the appointment of F. B. Patteson as manager, industrial sales division, succeeding Paul Hickman, who has been transferred to the research and development department.

Worthington Corp., Harrison, N. J., has appointed the Brinker Supply Co., Dover, Ohio, as distributor in the entire Cleveland area.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., announces that it has changed its corporate name to Wheelabrator Corp.

introducing
NEW Hendrick Wedge Wire

Now! With the addition of new Hendrick Wedge Wire, Hendrick rounds out its line of screens for the best in efficient, low-cost screening, sifting, de-watering and filtering operations. New Hendrick Wedge Wire not only affords tops in dependability and performance, but it's ideal wherever it's highly important for screen openings to be minutely fine, and have excellent draining qualities yet have a high degree of accuracy and absolute rigidity. For details on Hendrick Wedge Wire's free clearance, rugged mechanical and lateral strength, maximum load carry capacity, percentage open area and long wearing life, contact your nearby Hendrick representative.

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Perforated Metal • Perforated Metal Screens • Wedge Slot
and Wedge Wire • Architectural Grilles • Mitco Open Steel
Flooring • Shur-Site Treads • Armorgrids

Increased* CEMENT PRODUCTION
BRADLEY HERCULES MILLS

The quickest, most economical way to increase your grinding capacity

For the cement manufacturer with excess kiln capacity . . . here is the answer to INCREASED CAPACITIES at an appreciable SAVING IN HORSEPOWER. The Bradley Hercules Mill, used as a preliminary pulverizer before compartment mills or tube mills, results in INCREASED PRODUCTION of finished material at a LOWER COST per barrel.

Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum.

Automatic electrical feed control eliminates manual operation.

For complete information, write for Catalog No. 57

Bradley PULVERIZER CO.
LONDON ALLENTOWN, PENNA. BOSTON

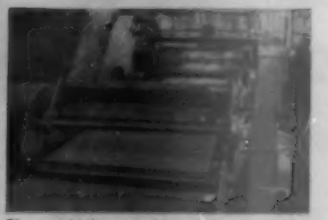
EHRSAM gypsum and wallboard processing machinery

...WILL MODERNIZE YOUR PLANT FOR GREATER EFFICIENCY AND BETTER PRODUCTS

PAPER SECTION for board line paper is fed to board line with proper tension — giving a smooth surface to finished product.

FORMING ROLL SECTION — precision rolls run on anti-friction bearings — giving board a uniform thickness throughout.

MATERIAL STORAGE AND FEED — stucco bins with drag feeders store and transfer sufficient material for constant operation.



Ehrsam Lathe punch, can be furnished in Reciprocating or Rotary style with board speeds up to 300 ft. per min.

Ehrsam Calcining Kettle to reduce the raw gypsum to workable condition. Several sizes are available in gas or oil fired.

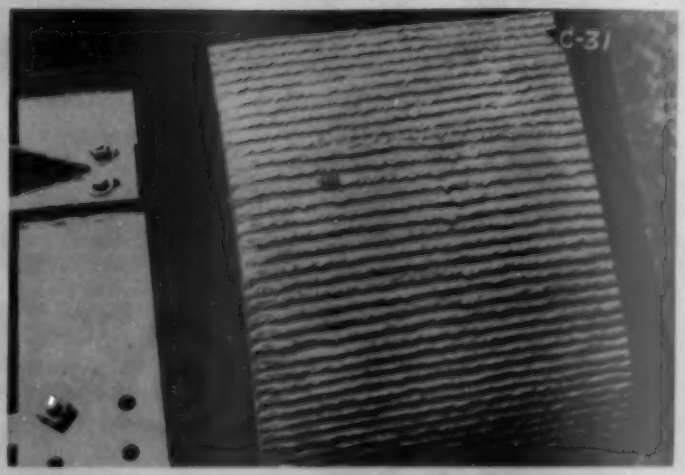
Ehrsam equipment will enable you to get the greatest returns from your plant by cutting maintenance and operating cost. Remember, if you are thinking of one machine or a complete plant, our staff of Engineers is available to you.

The J. B. EHRSAM & Sons Mfg. Co.
ENTERPRISE, KANSAS

RESISTO-LOY *reduces excessive maintenance costs on CRUSHER ROLLS*

In the use of RESISTO-LOY on manganese crusher rolls, the old rule applies — "It's not the first cost, but the upkeep that counts." If you are crushing large tonnages of hard materials daily, and if you are forced to maintain the rolls constantly, we can put a stop to the excessive costs of such maintenance. In the American way, the good old competitive way, we can be sure of one thing—"we get just what we pay for."

Regardless of price, we invite you to prove that statement to your own complete satisfaction. Good things DO cost more, and if you want the satisfaction obtainable from a composition of the finest metals available, then you can get this satisfaction from RESISTO-LOY.



The above illustration shows the correct application of RESISTO-LOY to produce ¾" minus materials. This is a job your plant welder can efficiently handle. Call in our Field Man. Let him show you how to cut maintenance costs on your rolls. He is a Specialist. You can count on his advice and recommendations.

THE RESISTO-LOY CO. INC., Grand Rapids 7, Michigan

AUTO VORTEX CLASSIFIERS...

MOST EFFICIENT BY ANY MEASURE FOR SINGLE OR MULTIPLE SPLITS!

COMPARE RESULTS . . . COMPARE COSTS . . . AGAINST ANY OTHER SAND GRADATION EQUIPMENT! AFTER SUCH COMPARISON, YOU, TOO, WILL BUY AUTO-VORTEX CLASSIFIERS . . . WHATEVER YOUR SPECIFICATIONS . . . WHATEVER YOUR PROBLEMS!

WRITE FOR OUR BULLETIN No. 81!

PATS. PEND.

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"CROSS HEXCREEN"

A Honey of a Screen for

More Strength

More Capacity

and

Engineered Performance

Look for this stamp on all "Cross" Products

The Sign of PLUS QUALITY for PLUS PERFORMANCE

CROSS Perforated Steel Sections and Decks for VIBRATING — SHAKING — REVOLVING SCREENS

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___Admixtures, Aggregate
___Aftercoolers, Air
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___Aggregates (special)*
___Air Compressors
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___Asphalt Mixing Plants
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___Bags*
___Barges
___Batchers
___Belting, Conveyor, Elevator, Power Transmission*
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits*
___Blasting Supplies
___Block Machines,* Concrete Building
___Bodies, Trailer*
___Brick Machines and Molds
___Buckets*
___Bulk Cement Handling Equipment
___Bulldozers
___Cars, Industrial
___Central Mixing Plants
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Concrete Forms
___Concrete Mixers*
___Concrete Mixing Plants
___Concrete Specialty Molds
___Concrete Waterproofing and Dampproofing
___Conveyors*
___Crushers*
___Coolers
___Cranes*
___Curing Equipment
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills*
___Dryers
___Dump Bodies*
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service, Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
___Feeders*
___Fifth Wheel, Heavy Duty Special
___Flotation Equipment
___Front End Loaders*
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media*
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives*
___Lubricants*
___Magnetic Separators
___Masonry Saws
___Mills*
___Pipe*
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___Scrubbers: Crushed Stone, Gravel
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___Tractors*
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

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Your Name_____ Title_____

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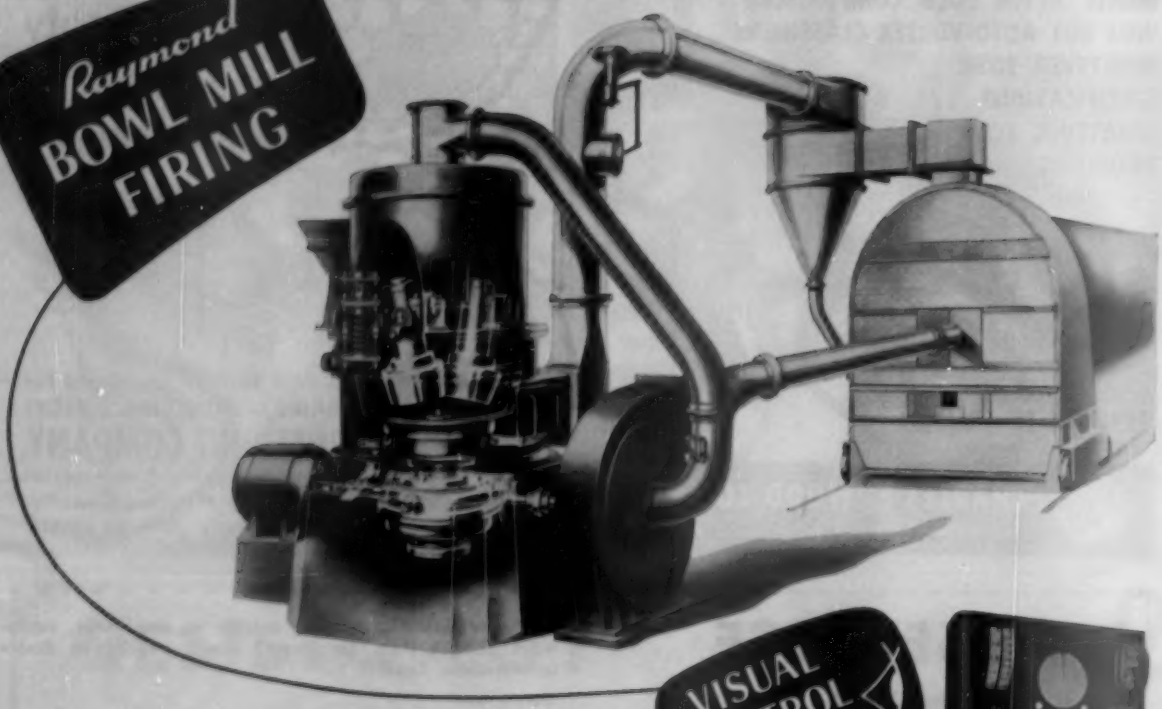
RP 11-55

Now you can maintain Top Level Kiln Efficiency

HIGH AVAILABILITY
GRINDING UNIFORMITY
OPERATING ECONOMY

Raymond BOWL MILL FIRING



VISUAL CONTROL PANEL

Panel Board gives continuous picture of Bowl Mill operation

THE Raymond Bowl Mill is entering its 21st year of service to industry for direct-firing rotary kilns.

Hundreds of installations attest its success—handling a total of more than 12 million tons of pulverized coal annually in the lime, cement and dolomite fields alone.

This combination grinding-firing unit not only gives efficient coal pulverizing but also insures a proper fuel-air mixture to the burner for maximum kiln performance.

It provides a complete, fully coordinated system with flexible control and automatic operation. It handles coal of any grade, grindability or moisture content.

Raymond "Bowl Mill Firing" can become an important factor in your planned economy for the year ahead by reducing your kiln operating costs and improving cement quality.

Write for Raymond Catalog No. 79 for further details of the Bowl Mill.

COMBUSTION ENGINEERING, INC.

Raymond Division

1307 North Branch St.
Chicago 22, Ill.

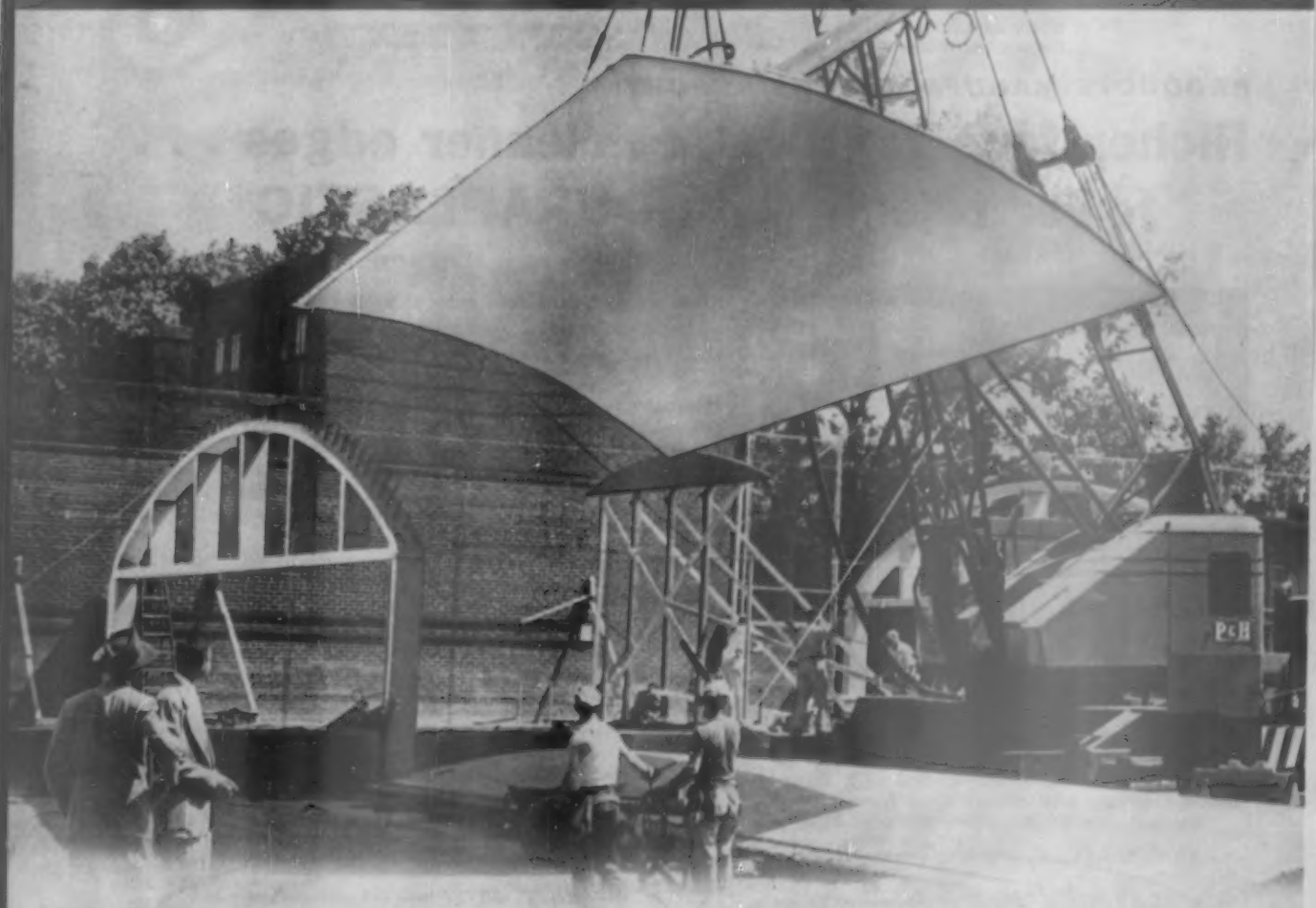
Sales Offices in Principal Cities

Combustion Engineering-Superheater, Ltd., Montreal, Canada

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE



Thin shell, reinforced concrete roof section made by the Ortega-Billner process

GOOD APPEARANCE BUILDS SALES and Duraplastic-made products like these at Pre-Cast Concrete Products, Inc., Chicago Heights, Ill., feature rich texture and clean, true edges for customer appeal.

PRODUCTS MANUFACTURERS REPORT:

Richer face texture . . . cleaner edges . . . fewer rejects with DURAPLASTIC*

MIXES MADE WITH ATLAS DURAPLASTIC CEMENT feed easily through this block machine at Pre-Cast Concrete Products, Inc. Less breakage and fewer culls mean lower production costs . . . higher profits for manufacturers.

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton • Kansas City Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

Here's how Duraplastic cement trims production costs and improves product appearance . . . helps you make and sell more concrete products at greater profits

It's *easier* to sell cleanly formed concrete products made with Atlas Duraplastic Air-Entraining Portland Cement. Smooth, cohesive Duraplastic-made mixes give products sales-promoting good appearance – clean, true edges, plus richer face texture. And products made with Duraplastic Cement offer high resistance to passage of water, another important sales point in your favor.

Atlas Duraplastic Cement means greater economy, too. Mixes are "rubbery" and hold together better. This means fewer culls and throwbacks . . . less breakage in handling of green products . . . reduced production costs and greater profits for you.

You'll produce better block and other products with Atlas Duraplastic Cement. Mixes made with it feed easily through the machine . . . help increase production.

YET DURAPLASTIC COSTS NO MORE than regular cement! Requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. Write for descriptive booklet. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

"Thrifty" says: Atlas Duraplastic Cement cuts costs and boosts profits by decreasing breakage and reducing the number of costly culls and throwbacks.
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INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is shown a construction scene in Philadelphia, Penn., where a thin shell, reinforced concrete roof section is being maneuvered into position over the concrete trusses. These sections were used to construct the roof of the St. Joseph's House swimming pool. The roof was precast in halves, vacuum-lifted into position and connected by poured-in-place joints. The resulting roof is light, economical and fire-proof. The lifting device was invented by Earl P. Billner, president of Vacuum Concrete, Inc., Philadelphia, Penn.

Spectra-Glaze Licensees

BURNS & RUSSELL COMPANY, Baltimore, Md., producers of Cermac glazing compounds, has recently licensed five additional block companies to manufacture tile-face Spectra-Glaze products. These include Edmonton Concrete Block Co., Ltd., Edmonton, Alta., already in production; Holloway Concrete Products Co., Inc., Winter Park, Fla., already in production; Edgar D. Otto & Son, Albuquerque, N. M., to begin glazing operations this fall; Thorold Concrete Block Co., Ltd., Thorold, Ont., to begin glazing operations this fall at new block plant at Hamilton, Ont., using high-pressure steam-cured block from its recently installed autoclaving facilities; and Western Brick & Supply Co., Lincoln, Neb., already in production.

Builds Ready-Mix Plant

HOME LUMBER CO. recently built a ready-mixed concrete plant at Hazard, Ky., which is said to be the city's first. Aggregates are received from hopper railroad cars by conveyors which transfer the materials to a bucket elevator which carries it to a three-compartment bin. Bulk cement is stored in a 225-bbl. capacity overhead bin. An auxiliary cement storage silo has a 400-bbl. capacity. Two 4-cu. yd. transit mixers are being used.

Installs Two-Way Radio

STATLER READY-MIXED CONCRETE CO., Kalamazoo, Mich., has installed a Motorola two-way radio communications system linking its fleet of trucks with the firm's headquarters. The system has a radius of 25 miles, giving the company full coverage in its primary trading center.

Concrete Siding Block

ALLIED CEMENT BLOCK CO., Muskegon, Mich., is manufacturing concrete siding block using a Dunn Standard Korpak block machine equipped with a special siding block attachment. John F. Kadelsik is the owner of the company.

Masonry home built of siding block manufactured by Allied Cement Block Co.

Precast Concrete Curbing

CONCRETE PRODUCTS CO., East Hartford, Conn., has added precast concrete curbing to its line of concrete products. Precast curbing has been used extensively in the Southwest, and is being introduced in the Northeast. A feature of the curbing is that it is held in place by two cast iron dowels between each section. It can be totally salvaged and used again, if it becomes necessary to remove it from the original installation.

Buys Tile Company

TEXAS INDUSTRIES, INC. has purchased Redondo Tile Co., Ltd. of Southern California for $1,500,000, as announced by Ralph B. Rogers, president of Texas Industries. The tile company, formerly owned by George Fackt and Lionel Weiss, manufactures glazed ceramic floor and wall tile. The company is now organized as a Delaware corporation, when formerly its products had been sold principally in the Los Angeles, Calif., area. Mr. Weiss remains president of the firm, and Mr. Rogers is chairman.

Buys Interest in Firm

WILLIAM C. SCHMIDT AND ERIC A. KREHBIEL of Kendall Roadways Inc. and the Clarence Sand and Gravel Co., have purchased 50 percent interest in Amherst Ready Mixed Concrete Corp., formerly held by Fred Seitz, president of Fred Seitz Inc., a plastering-lathing firm at Checktowaga, N.Y. Mr. Schmidt is the new president of the company, Harvey H. Pfennig, who retains his holdings in the company, continues as vice-president, Mr. Krehbiel is treasurer and George F. Schneider has been named sales manager. Franklin P. Taylor is general manager.

W. J. MURPHY has started operations at a concrete block plant on a three-acre site north of Salem, Ore. The plant has a daily capacity of approximately 7000 to 10,000 units. Mr. Murphy is the former owner of City Concrete Block Co., Leavenworth, Kans., which was purchased by E. A. Geiger, Jr., owner of the Geiger Ready Mix Co., Leavenworth.

READY MIX CONCRETE CO. OF HOLLYWOOD, INC., has started operations at a ready-mixed concrete plant at Hollywood, Fla. The company has been operating a plant in Fort Lauderdale, Fla., for several years. J. W. Birdsell is president of the firm and Gary Marable is general manager of the company.

SNYDER'S CONCRETE PRODUCTS COMPANY, Dayton, Ohio, is producing marble-faced concrete block at a recently built plant costing about $35,000. Daily production is about 3000 units, each block having a marble face approximately ½ in. thick. The block can be faced on one or both sides.

GREEN AND SAWYER CO., Lima, Ohio, has acquired a concrete mixing plant, costing $100,000, and is operating it in Bath Township, Ohio, as the company's fourth plant. Production amounts to about 1200 to 1500 cu. yd. of concrete daily.

A READY-MIXED CONCRETE PLANT, costing $15,000, has begun operations north of Boonville, Ind., owned and operated by Randall Sanders and Albert Ashley.

GLACIER SAND AND GRAVEL CO., Minneapolis, Minn., and Anchor Block Co., St. Paul, Minn., are producing a modular 8 x 8 x 16 in. concrete control joint block for use in industrial buildings.

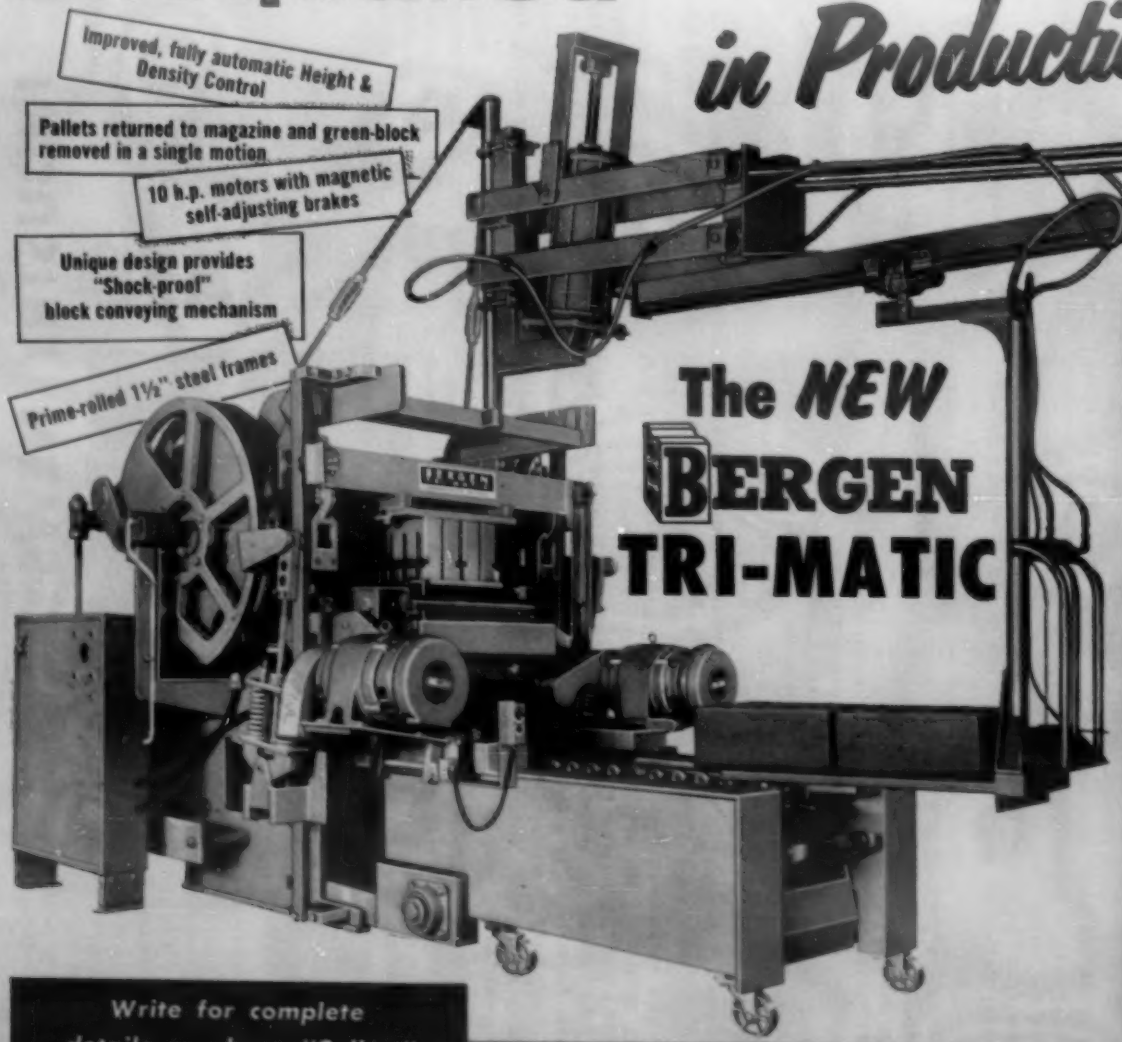
SOUTHERN MATERIALS CO. has opened a ready-mixed concrete plant at Lynchburg, Va., producing ready-mixed concrete and sand and gravel. A. D. Preston is plant manager.

WILLIAM SMITH AND SONS READY-MIX CONCRETE plant recently began operations at Vandalia, Mo. The plant manufactures ready-mixed concrete and other building products.

AREY CONSTRUCTION CO. has started operations at its newly built concrete pipe plant at Pampa, Texas, on the site formerly occupied by the Danciger Refinery plant. Ernest Arey is president of the company.

SIMPLEX PRECAST INDUSTRIES, INC., is building a plant, costing about $150,000, near Norristown, Penn., manufacturing precast concrete products, roofing tile, floor tile and stepping stones. Godfred Fugger is president of the firm.

Unequalled *in Production Capacity*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BUILDERS OF BETTER MIXERS FOR MORE THAN 55 YEARS

FORT WORTH SAND AND GRAVEL CO. V. P. CHARGE OF SALES, GEO. A. MEIHAUS, SAYS:

"Radio saves us $10.00 a day per truck"

Mixer driver Alvin E. Nobbs has just received instructions to proceed directly to his next job without going back to plant.

From his mobile repair van J. A. Markham talks directly to drivers, often diagnoses trouble so driver himself can make emergency repairs.

Chief radio dispatcher Coy Anderson gives instructions to a driver miles away.

READY MIX OPERATORS:

HERE IS CONSTANT CONTROL OF 51 TRUCKS OPERATING BETWEEN 5 PLANTS

Diverting trucks as needed to handle the output of five separate mixing plants was a king-size job. But Motorola 2-way radio has reduced it to everyday routine for the Fort Worth Sand and Gravel Co. of Texas.

Constant radio control—every minute of the day—of every one of the 51 mixers has resulted in a *saving* of about 20% in mileage per yard of delivered concrete. Drivers get their new orders *at the job site*, and usually go *directly* to the next job without needless travel. Radio actually gets an *extra hour* of bonus production daily from every truck.

Besides speeding delivery and giving better customer service, Motorola 2-way radio has cut costs many other ways. Overtime of drivers and batch plant personnel has been slashed at Fort Worth. Telephone "hunting" by drivers has ended . . . reports are sent and orders received right in the cab. One radio equipped service van does the work of two . . . speeding repair and cutting down-time.

Five supervisors, out most of the time in their radio equipped cars, have instant contact with the main office. Meihaus says his company wouldn't be without 2-way radio now.

Find out how Motorola 2-way radio can pay for itself quickly by cutting costs for *you*, and go on to earn extra profits month after month. A Motorola Engineer will show you how. Write, phone or wire—TODAY!

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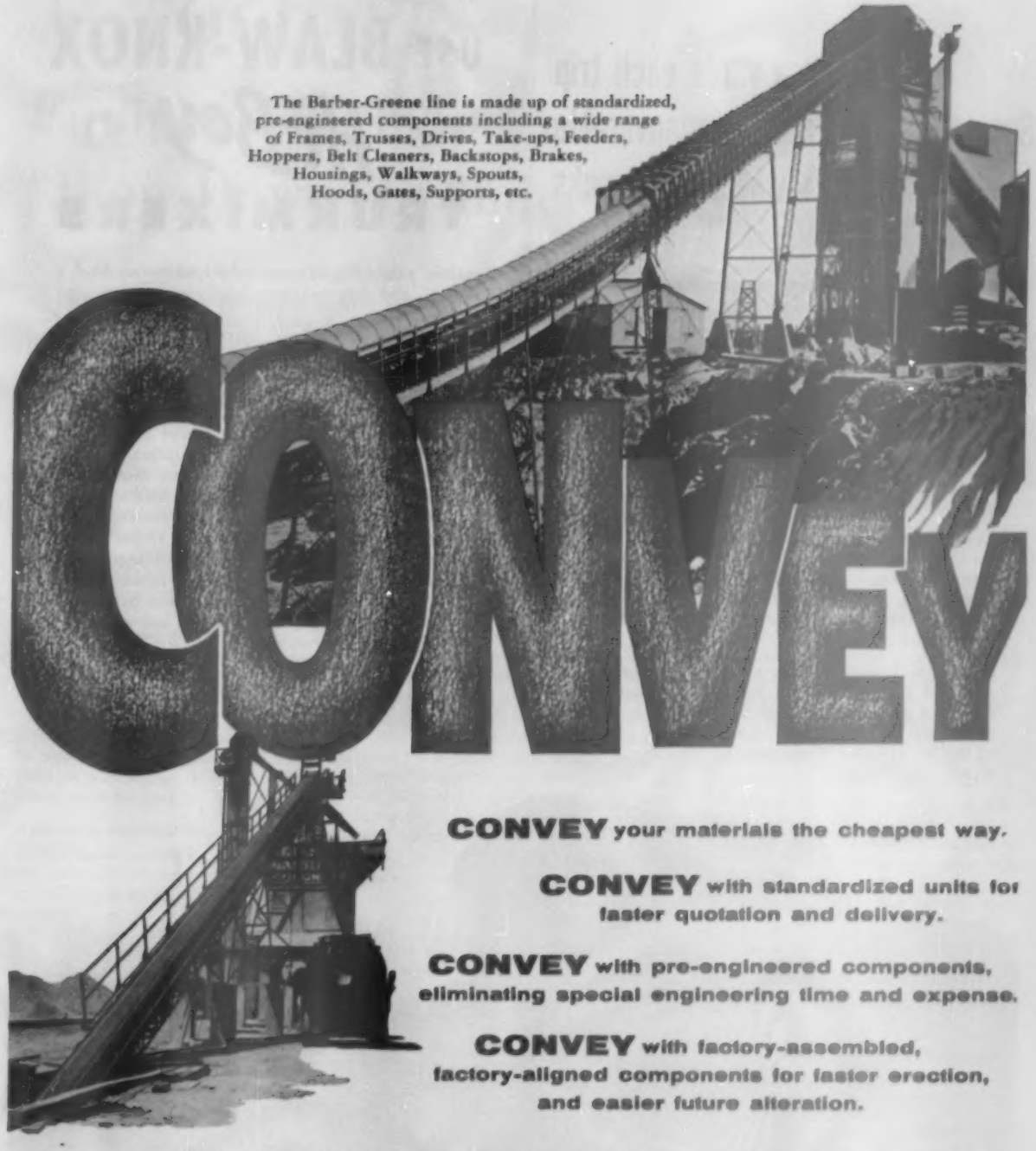

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Haul extra yards each trip
Save time with more maneuverable short wheelbase trucks

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How would you like to haul a load or two more a day... and carry maximum legal pay load each trip?

You can do it easily with Hi-Boy Trukmixers!

Hi-Boy 4½, 5½ and 6½ cu. yd. Trukmixers are designed to solve three profit-stealing problems... weight, length and axle load. Combining the flush water tank and pedestal, reduces total weight of the unit by about half-a-ton and substantially lowers the center of gravity of the mixer. Locating the engine to the left rear permits moving the mixer forward 20" and shifts the load center of gravity closer to the front axle so it can carry more of the legal weight allowance. These design improvements let you use highly maneuverable short wheel base trucks that get you through traffic, into the job site, up to the forms and back to the plant *fast*. In the time saved you can often haul an extra load or two a day!

MORE *Hi-Boy* DESIGN IMPROVEMENTS

Large Diameter Short Drum mixes even zero slump concrete fast and thoroughly. Concentrates batch at front end for better over-all weight distribution.

Big Inner Cone for Fast Charging . . . 8-9 seconds per yard . . . and eliminates spilling of materials.

Better Blade Design, with flange on the discharge side, prevents segregation during discharge.

Low Maintenance results from the accessibility of the side-mounted transmission and engine, which permits easy inspection of vital parts. Engine and radiator enclosed against all weather conditions. Inexpensive, easily cleaned air filter protects the radiator.

Be sure to investigate the many more profitable, practical Hi-Boy features before you decide on any truck mixer . . . and ask your Blaw-Knox distributor to explain the advantages of the Blaw-Knox "Complete Ready-Mix Package."

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AUTOCLAVE

Equipped With Special "Blow-Down" Cylinder

• Graystone, Inc., Seattle, Wash., experimenting with high pressure curing system for both concrete block and pipe

By WALTER B. LENHART

Bulk cement and pumice bins (to rear) and unloading facilities

GRAYSTONE, INC., which operates concrete products plants at Aberdeen, Bellevue, Centralia, Chehalis, Everett, Olympia, Shelton and Seattle, Wash., has recently joined the ranks of autoclave users. This new installation is in the Seattle plant where the home office is located.

There are now three companies in the Northwest using autoclaves; one in Tacoma and an older concern that specializes in sand-lime brick. The Graystone installation is the more recent, and it is being operated largely on an experimental basis with expectations that possibly later more autoclaves may be installed.

Autoclave Installation

The Seattle autoclave is 8 ft. 1 in. dia. and 102 ft. long with a Truax quick-closing door. The door is of fabricated steel construction and uses a rotating locking ring operated by two oil hydraulic cylinders. Around the perimeter of the door are 16 lugs which engage in recessed openings in the door and locking assembly, and a Johns-Manville gasket is used. The one at Graystone has been in use for over 200 closures while 80 closures was the expected life. It has been reversed once during the time in use. A safety valve is provided that insures zero pressure within before the door can open. The door is swung from a davit with the door swinging around and to the side of the shell. This design permits easy and accurate alignment of the door when it is closed, and it reduces the amount of room needed in front of the autoclave which must be bridged.

The shell, of 5/8-in. steel, is anchored to its foundation near the door. Expansion slides are under two of the three saddles supporting the kiln. At the rear end is an exhaust fan that clears out remaining vapor in the autoclave and helps to lower the temperature within to a working level. When the door is ready to be closed, the fan is usually started and the resulting suction helps pull the door more easily into place. The kiln has been provided with five vacuum rings

Left: Lift truck equipped with flanged steel wheels moving loaded rack into autoclave. **Right:** One of the two oil hydraulic cylinders that operates closing ring on autoclave door

Muffler cylinder used to release steam from autoclave. Robert Condon, plant manager, to the left

Exhaust fan at end of autoclave is used to lower temperatures to desired working condition. Note vacuum ring around autoclave

spaced along its length and a vacuum pump has been installed in the assembly to lower the moisture content of the block to any reasonable low figure. The shell was fabricated by the Hydraulic Supply Mfg. Co., Seattle, Wash. The autoclave, without the boiler, represents an investment of about $40,000.

Curing Cycle

The curing cycle in the autoclave, a total of 10½ hr., is as follows: 3 hr. to bring up to the 140 p.s.i. operating pressure, 5 hr. holding, ½-hr. blow down, 1 hr. unloading, and 1 hr. loading. The kiln, which operates on a two-cycle per 24-hr. basis, holds 30 racks of 72 (standard 8's) each, thus curing 4320 units in 24 hr. It is loaded by a Towmotor with flanged and rubber wheels. The rubber wheels are on the inside and of larger diameter than the flanged. Industrial trackage is provided into the kiln and across the bridged area immediately in front of the kiln. The kiln is presently covered at head end only but a building will be placed over it later. Steam for the kiln is supplied from the boilers used for the conventional steam curing kilns still in use. These units develop 240 b.hp. An Enterprise oil burner with Minneapolis-Honeywell controls is used.

For blow-down purposes an adequate muffler has been provided that consists of a horizontal steel cylinder about 40 ft. long and 30 in. in diameter. The cylinder was previously used as a gas scrubber tower in a local utility gas works. Inside the muffler tube are a series of baffle plates. Attached to the baffle plates are blister-like cups with specially designed outlets around the periphery of the cup so that the steam is broken into small streams with their direction of travel changed. Each compartment is about 30 in. long. The device was assembled by the company and works very successfully in reducing the noise from the blow-down. The line drawing shows the general principle involved in the muffler.

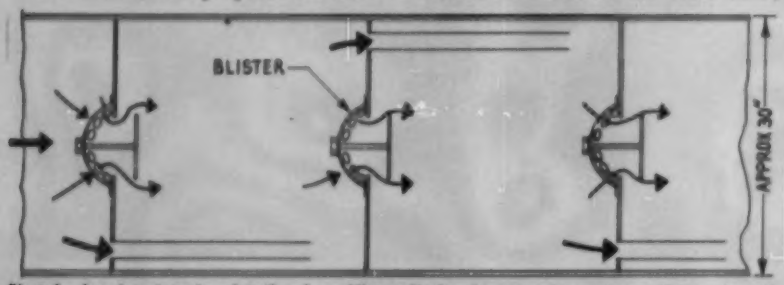
Graystone of Seattle has two Besser machines; one 2-block and one 3-block machine. Production from the 3-block machine is cured in the autoclave. A natural, finely divided silica sand material is being currently used in the mix, replacing some of the portland cement normally used. The use of this material is still on an experimental basis. The sand is a yellow colored material secured near Auburn, Wash., and trucked into the plant. It essentially is a residue from previous sand washing operations.

Pumice and expanded shale concrete block are also made. These are first steam cured in the older kilns, and after cubing are placed in a dryer where steam coils and some live steam raise the humidity and the temperature of the block. The cubes are then stored in the yard under cover. After this treatment the moisture content is down to an acceptable figure. It was said that heating the block without the humidity factor seemed to seal the outer surface of the block and materially lowered the drying rate. Sections of the storage yard are covered, and the trend here is towards more covered storage.

The block and pipe operations use weigh batchers equipped with Toledo scales. A lorry on a monorail delivers the aggregates to 40 and 50-cu. ft. Besser mixers. Portland cement is carried in a separate lorry to the mixers. A Standard Oil Co. admixture, D-40, is used in most of the concrete.

To Make Foam Concrete

The company has a National Foam System generator and the required reagents, and contemplates doing some test work on foam concretes with autoclave curing. Under this system the foam is generated separate from the mix and injected into the concrete mixer. Finely divided silica, water, portland cement and the foam make a lightweight concrete structural unit with surprisingly high strengths, especially when cured at high steam pressures.



Sketch showing interior details of muffler cylinder for autoclave steam "blow-down"

Try Autoclave Curing of Sewer Pipe

Some work of an experimental nature is also contemplated with reference to high pressure steam curing (autoclave) of concrete sewer pipe, using finely divided silica as replacement for some of the portland cement. Evidence is available from other sources to indicate that this procedure will not only make a better and stronger pipe with less expansion and

A fleet of 22 trucks of various sizes and makes deliver products from Seattle plant

contraction, but will take up the free lime that is liberated when the concrete sets, thereby removing the free lime from the concrete pipe after curing.

Sand and gravel delivered to the plant by barges is unloaded by a Michigan front end loader. Pumice and expanded shale aggregates arrive by rail. Some outgoing shipments are made by barge although the company has a fleet of 22 trucks, including some semi-trailer haulage units for delivery purposes.

Make a Variety of Products

Most of the operations in the various cities are separate corporations. The parent corporation is designated, Graystone of Seattle, and it includes the Bellevue branch.

It is typical of these operations, manufacturing a wide variety of concrete masonry units, concrete pipe, and other precast concrete items; such as, septic tanks, manholes with steel ladder rungs, and clean-out pockets. Concrete sewer pipe from 4-in. dia. through 84-in. is manufactured, using Hamilton Kent's "Tylox" rubber joints. Pipe 30-in. dia. and larger are made in 8-ft. lengths, and a special casting yard is available for the larger diameter pipe. Drain tile is made on Dunn and Columbia 12-Hi machines. Four other pipe machines are available in addition to the Dunn. All are tampers with several company improvements. All concrete pipe is steamed for 3 hr. or more. This is done for the most part under tarpaulins. A portable yard crane with a 60-ft. boom and three horizontal travelling cranes that span part of the yard handle the heavy casting operations. Clark and Towmotor lift trucks move finished products.

A chimney block which has met with exceptional success in the area, is 4 in. thick and 8 in. high and has 75 percent solid and 25 percent core. The block is cast 17 in. long and is scored so the mason can easily break it into shorter lengths. This design meets fire specifications.

William F. Paddock is chairman of the board of Graystone, Inc., and Fred Kettenring is president. Robert W. Condon is manager of Graystone of Seattle.

N.C.M.A. Report On Concrete Block Curing

THE NATIONAL CONCRETE MASONRY ASSOCIATION has issued a report, entitled "Effect of Curing on the Properties Affecting Shrinkage Cracking of Concrete Block," giving the results of an investigation conducted by Prof. Washa, Prof. Saemann and Curtis Warren in the Materials Testing Laboratory of the University of Wisconsin.

The main purpose of the investigation was to develop information regarding the effect of elevated temperature drying of cured block on its theoretical relative immunity to cracking. The study was unique in that it recognized tensile strength and elastic properties as important factors in the problem, in addition to the more commonly accepted factors such as drying and temperature shrinkage. Also discussed is the effect of degree of restraint in causing the incidence of cracking to vary between buildings even where the block are of the same composition and quality.

The report is available from the Association at 38 S. Dearborn St., Chicago 3, Ill.

Stockton Building Materials Co., Stockton, Calif., dedicating its new 600-cu. yd. capacity automatic ready-mixed concrete batching plant. Attending the formal dedication ceremonies were (left to right): Mayor Dean De Carli of Stockton; George Ernest, president, Stockton Chamber of Commerce; William Wallace Mein, Jr., president, Calaveras Cement Co. and also of the Stockton firm (which is a Calaveras subsidiary); and Fred "Buzz" Winkler, Jr., vice-president and manager of the Stockton firm. Mr. Winkler is shown demonstrating the weighing mechanism of the batching plant, which was supplied by the C. S. Johnson Co.; the push button controls are in the foreground. The plant, said to be the largest automatic batching plant west of the Mississippi River, has an operational cycle of 90 sec.

Looking down at Plant No. 1, showing cement storage silos and aggregate stockpiles for production of ready-mixed concrete and concrete pipe. In the background may be seen a line-up of mixer trucks and the concrete pipe storage area

Operate Four Plants — 50 Mixer Trucks

• Anderson-Dunham, Inc., Baton Rouge, La., also makes concrete pipe and tanks, operates bituminous plant, and quarries limestone and gypsum

By HUBERT C. PERSONS

FOUR READY-MIXED CONCRETE PLANTS, a concrete pipe works and an asphalt plant are included in the varied activities of Anderson-Dunham, Inc., Baton Rouge, La. Three of the ready-mixed concrete plants are in Baton Rouge and a fourth is in Plaquemine, La., 20 miles southwest. The company also has a large crushed limestone and gypsum mining operation at Winnfield, La. In addition to these enterprises, the company makes metal culvert pipe, septic tanks and various types of underground storage tanks. These undertakings, all of which are currently running at full tilt, produce an annual sales volume of close to $8,500,000, according to Ted Dunham, Jr., vice-president. The Baton Rouge plants employ more than 200 people.

Anderson-Dunham, Inc. was organized in 1937 and began operating a ready-mixed concrete plant in Baton Rouge with six 1½-cu. yd. Rex mixer trucks. A concrete pipe plant was added two years later. Today the company's ready-mixed concrete plants in Baton Rouge operate 50 mixer trucks, chiefly on International tandems with 6-cu. yd. Challenge mixers. All trucks and mixers are operated on propane gas.

Typical tractor-semi-trailer unit operated with propane gas fuel. The 32-ft. trailer is carrying 84-in. pipe

Two-Way Radio Speeds Operation

All plants and all transit mixer trucks, equipped with two-way radio telephones, are in constant communication with each dispatching office. This system, set up by Radio Corporation of America, has been in service nearly two years. Company executives say it has effected substantial savings in operating time in addition to increased efficiency of service to customers.

Plant No. 1 is located on an 8-acre tract of land in the middle industrial section of Baton Rouge. Equipment includes a six-compartment Butler bin which holds 850 bbl. of cement and 400 tons of aggregates. Aggregates reach the batching tower on a 24-in. belt conveyor, 250-ft. centers. A 1½-cu. yd. Model 655 P & H crane unloads aggregates from railroad cars. Other batching equipment includes a 3-cu. yd. weigh batcher with dial scales and a 2-cu. yd. Rex mixer. When this plant was first set up in 1940, it was the largest ready-mixed concrete plant in the South.

Plant No. 2 is located on a 12-acre tract of land on the Scenic Highway just north of the city limits. Here the batching tower has a four-compartment Butler bin fed by a 24-in. belt conveyor, 225-ft. centers. The bin holds 900 bbl. of cement and 200 tons of aggregate. There is also a ground storage bin holding 800 bbl. of cement. Operating equipment includes a 3-cu. yd. Smith tilting mixer and a 4-cu. yd. weigh batcher. Aggregates are unloaded from railway cars with a 3-cu. yd. Lima crane. The entire plant is enclosed by a cyclone fence.

Start Big Expansion Plan

Plant No. 2 was built in 1952. The previous year, the company had secured a contract from duPont calling for 100,000 cu. yd. of ready-mixed concrete on the Atomic Energy Commission's Savannah River project at Aiken, S. C. Work on the contract was begun in March, 1951 and completed in less than seven months ending in September, 1951. Equipment which had been set up for the Aiken job, was moved back to Baton Rouge, starting an expansion program which is still continuing. This was necessary, company officials say, in order to keep pace with the swift industrial development of Baton Rouge which has grown from 35,000 population in 1937 to 175,000 in 1954.

Anderson-Dunham has participated actively in the industrial growth of Baton Rouge during the past 18 years. Ted Dunham, Sr., president and founder of the company, convinced Standard Oil Co. executives that ready-mixed concrete would expedite construction of the 200 million dollar Baton Rouge refinery. Since that time ready-mixed concrete has been supplied for new plants of the Ethyl Corp., Solvay Process Corp., Permanente Metals Corp., Gulf State Utilities Corp., Ideal Cement Co., and many others including five synthetic rubber plants.

A third ready-mixed concrete plant, located on a 10-acre tract of land, has just been completed by the company in the south end of Baton Rouge. This has a 200-ton Butler four-compartment bin, a 3-cu. yd. weigh batcher, and a 3-cu. yd. Smith tilting mixer. A 200-ft. belt conveyor carries materials to the batching tower. Each of the three Baton Rouge ready-mixed concrete plants has a capacity of 100-cu. yd. per hr.

Batching tower at ready-mixed concrete Plant No. 1 which supports a 6-compartment bin holding 850 bbl. of cement and 400 tons of aggregates

Concrete Pipe Plant

The concrete pipe plant adjoins ready-mixed concrete Plant No. 1. Two pipe machines are located in a building 250 ft. x 175 ft. A Model T McCracken pipe machine is used to make both tongue and groove and bell and spigot pipe in diameters from 12-in. to 36-in. in 4-ft. lengths. A heavy duty Quinn machine is used to make 42-in. to 84-in. dia. pipe in 6-ft. lengths. The pipe machines are served by a 40-cu. ft. Besser mixer. A 600-bbl. cement silo supplies the pipe plant.

Ready-mixed concrete Plant No. 2 on Scenic Highway at north edge of Baton Rouge, La. Note two-way radio system mast on top of plant

Quarry at Winnfield, La., where both limestone and gypsum are mined

Aggregate is fed from a three-compartment 200-ton bin. Aggregate from cars or stockpiles is carried to the bins by a bucket conveyor. The greater part of the yards is occupied by a curing area where pipe are water-sprayed for 24-hr. More than 4000 tons of pipe of various sizes are stored in the yards. Pipe deliveries are made by truck within a radius of 100 miles of the plant. For this purpose a fleet of nine single-axle International Model 212 trucks with tandem 32-ft. Nabors trailers is maintained.

The company's asphalt plant in Baton Rouge is a Barber-Greene unit with a capacity of 50 t.p.h. Much of the plant's output is used in both maintenance and surfacing of city streets and state roads in the Baton Rouge area.

Quarries Limestone and Gypsum

In 1949, Anderson-Dunham acquired a 100-acre quarry and crushing plant at Winnfield, La., producing limestone used for roadstone and as concrete aggregate. Core drilling in the quarry area revealed a rich deposit of almost pure gypsum underlying the limestone. The plant now ships more than 360,000 tons annually of agricultural limestone and road aggregate and also gypsum used by cement companies in Alabama, Louisiana, Mississippi and Texas. R. W. Daughtry is general superintendent of the quarry operations.

Quarry equipment at Winnfield includes four 3-cu. yd. Bucyrus-Erie steam shovels and six 20-ton Euclid trucks. A 36-in. belt conveyor, 250-ft. centers, carries the rock to the crushing plant.

A 25- x 40-in. Cedarapids jaw crusher is used for primary crushing. Secondary crushing is done by a 30- x 33-in. Cedarapids hammermill. The plant also has four 4- x 12-ft. Cedarapids vibrating screens. The operation employs 70 men.

Anderson-Dunham's metal culvert and metal tank plant was established in 1953. It is currently making culvert pipe for commercial and highway uses. The metal operations occupy two quonset-type buildings 40-ft. x 160-ft. This is said to be the largest plant of its kind in the State.

Another division of Anderson-Dunham is the Dunham Tank Co. This division is the only fabricator of complete oil field control equipment in Louisiana. This branch produces bolted tanks, high and low pressure separators, scrubbers, treaters and welded tanks. The fabricating plant is located 30 miles east of Shreveport, La., at Minden. The company employs 125 men in this operation which was started in March, 1954. It has ten sales offices in Louisiana, Texas, Mississippi and Oklahoma, and it is the third largest consumer of steel products in the state.

Officers of Anderson-Dunham, Inc. are Ted F. Dunham, president; E. L. Peebles, vice-president and general manager; Ted F. Dunham, Jr., vice-president and K. O. Dunham, secretary and treasurer. The Anderson name in the company was that of Jim Anderson, an early associate of Mr. Dunham in the Texas and Oklahoma oil fields. The company is now wholly owned by Mr. Dunham although the Anderson name has been retained. Berlin Wall is general superintendent of both the Baton Rouge and Plaquemine operations.

Ted F. Dunham, Sr., is also president of Dunham-Price, Inc., manufacturers of ready-mixed concrete and concrete pipe in Lake Charles, La. This company operates 30 mixer trucks from four plants in Lake Charles. The pipe plant uses a Dixon and a Tuerk-McKenzie pipe machine, making sizes from 4-in. drain tile to 60-in. reinforced concrete pipe. The company's trucks are operated with propane gas fuel, and are all radio controlled as are the trucks in the Baton Rouge plants of Anderson-Dunham. Ashton Fenet is vice-president and general manager of Dunham-Price, Inc.

N.C.M.A. Regional Meeting

THE SOUTHEASTERN REGIONAL MEETING of the National Concrete Masonry Association will be held in conjunction with the Texas Concrete Masonry Association, November 20-23, 1956, at the Shamrock Hotel, Houston, Texas.

"Economic Trends in the South" will be discussed by Ed. C. Burris, executive vice-president, Texas Manufacturers Association. Governor Allan Shivers of Texas or Senator Price Daniels (D. Texas) will address a luncheon.

Industry talks will include an address by Cedric Willson, Texas Industries, Inc., Dallas, Texas, who will speak on the participation of the concrete masonry industry in "Operation Cue," the recently concluded atom bomb tests at Yucca Flats, Nev. Technical discussions will include a talk by Wolf G. Bauer, Atlas Building Products Co., El Paso, Texas, on "The Effect of Pozzolanic Materials in Concrete Masonry." Panel discussions on high pressure curing, single and double phase, carbonization curing and other new techniques for curing concrete masonry products are also on the agenda.

The meeting will conclude with speeches by S. Carl Smithwick, N.C.M.A. president, Smithwick Concrete Products, Portland, Ore.; Earl W. Peterson, N.C.M.A. vice-president, Ideal Cement Stone Co., Omaha, Neb.; and E. W. Dienhart, N.C.M.A. executive secretary.

Oklahoma Ready-Mix Group

OKLAHOMA READY-MIX CONCRETE ASSOCIATION was recently formed by about 50 Oklahoma ready-mixed concrete producers. Fred Hammond, Lawton Transit Mix Co., is president of the association. Other officers are W. R. Potts, Pryor, first vice-president and Hugh Hughes, Cushing, second vice-president. The board of directors includes Valdie Carr, Oklahoma City; Jack Hisey, Ardmore; Ivan Smith, Duncan; and Jack McMichael, Jr., Tulsa.

Another BESSER Booster*

*This is the 123rd of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Las Vegas Block Plant Installs Two More VIBRAPAC Machines

Cind-R-Lite Company, Las Vegas, Nevada, has had excellent results with their first Vibrapac machine purchased in 1946. This is evidenced by the fact the company installed two additional Vibrapacs during the past year.

Why does Cind-R-Lite prefer Vibrapacs for producing quality block? Let's ask H. O. Allen, General Manager. Mr. Allen states: *"This machinery is far superior to any block manufacturing equipment on the market to date"*. Currently, the three Vibrapac machines are kept busy producing cinder block. Some of the units are split and sold under the trade name of "Vegas Stone".

The company has kept pace with the rapid growth of the city of Las Vegas where the census has doubled in the last five years. The glamour hotels and motels of Las Vegas are all built with cinder block. The newest hotel, "Star-Dust", is using one and a half million 8 x 8 x 16 units.

These Cind-R-Lite executives have reason to smile. They are getting TOP production from their Vibrapac machines. Left to right, H. O. Allen, General Manager; Larry Allen, General Superintendent; and Karl Baker, Comptroller.

Exterior view of Cind-R-Lite plant. Note large stock piles of Vibrapac block, mostly 2-core units. 75% are made of volcanic cinder material gathered from a cinder cone located about 100 miles from the plant.

Mormon church in Las Vegas, constructed of 8x4x16 cinder block supplied by Cind-R-Lite.

Three Vibrapacs in a row at the Cind-R-Lite plant. Fully automatic. No manual lifting. Off-bearer removes finished block with power hoist.

Ask your nearby Besser Representative for Vibrapac literature, or write:

BESSER COMPANY • Box 135 • Alpena, Michigan, U. S. A.

Complete Equipment for Concrete Block Plants

A 8496-1PBC

World's Leading Manufacturer of Concrete Block Machinery

In addition to concrete block, this plant manufactures a wide variety of precast concrete slabs and structural members

PRECAST SLABS Produced In Two Basic Types of Units

• Carter-Waters Corporation, Kansas City, Mo., manufactures reinforced concrete roof and floor slabs, structural members, and concrete block

By TIP BROWN

A GOOD EXAMPLE of a concrete products plant devoted to manufacturing a wide variety of products is the Carter-Waters Corporation located on an eight-acre site in the eastern section of Kansas City, Mo., about five miles distant from the company headquarters building.

At this busy place, plant engineer, Jack Seibel spends very little time in the air-conditioned office building on the property. He thinks that a desk is a fine piece of furniture, but he would much rather watch what goes on in the plant.

A matter of particular interest on this trip to the plant was to pinpoint the rapid growth of Carter-Waters in the precasting field. The answer was not hard to find by observing the steady production of floor slabs or roof slabs which are finding a market in a 200-mile radius. Of the two types of manufacture, long span slabs are adaptable to both floors and roofs, while short span slabs are used primarily for roofs. Long span slabs are designed for either simple or continuous spans. Roof insulation data and loading tables have been carefully worked out to give purchasers the full benefit of research and engineering information. Short span slabs start at 4-ft. lengths and weigh 11½ lb. per sq. ft.; long span slabs extend to 38 ft. in length and weigh up to 44 lb. per sq. ft. Made with Haydite lightweight aggregate, the slabs weigh approximately one-third less than ordinary concrete, a factor of considerable importance in reducing load factors and making handling easier at the job site. Shop drawings are prepared in the engineering department of the company based on the architect's or engineer's plans and the details of the fabricator of the structural framing. Casting does not begin until all details have received final approval.

Manufacture

The slabs are made of two gradations of Haydite aggregate blended from seven different screen sizes manufactured by the company in its own plant, using Type III (high early strength cement) and water to produce 5000 p.s.i. concrete on standard cylinders in 28 days. A mix of 6¾ sacks of cement is used to produce a stiff concrete which meets all requirements for placing, strength, and finished appearance. Local commercial laboratory tests are regularly employed in all manufacturing operations.

The precast channel slabs are formed in metal molds using high-frequency vibration for maximum density and smooth surfaces. Molds for the long spans are properly aligned and braced to insure dimensional tolerances of ⅛-in. (plus or minus) in width, and ½-in. (plus or minus) in length, and ¼-in. (plus or minus) in longitudinal alignment.

All long span slabs are required to support the design load with a resulting deflection not greater that 1/360th of the span. They are cast with a camber to compensate for this deflection. Slabs are properly cured and surfaces are free from structural defects that might preclude their use.

The reinforcing complies with A.S.T.M. specification A-305 for deformed bars which are accurately centered in the legs of the channels for maximum strength in carrying the load from purlin to purlin. Special welded wire fabric reinforces the web between the channel legs. The bars are accurately positioned by special chairs to prevent displacement so that the

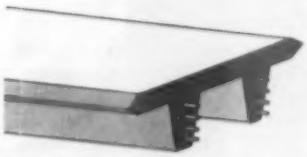
Big Profits!

WITH FORM-CRETE*

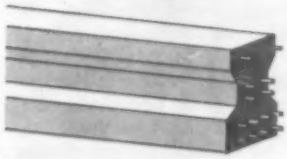
PERMANENT STEEL FORMS

...for casting multi-purpose concrete products

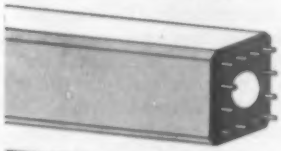
All "Form-crete" forms are manufactured from A.I.S.C. specifications high quality steel.



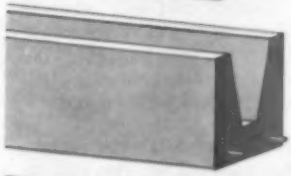
DOUBLE "T"—Steel forms for poured-in-place beds and all steel semi-portable beds. Also "Form-crete" Design Filler channels in 2" and 4" graduations.



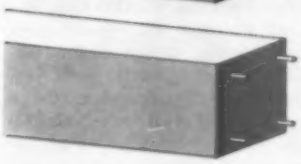
BRIDGE BEAMS—Full range of all steel forms for pre-stressed and post-tension "I"-Beams.



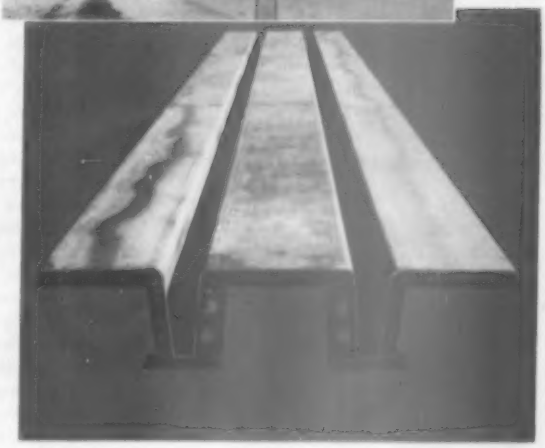
SQUARE AND OCTAGONAL PILING—Full range of steel forms including pallet liners and points.



HOLLOW LINTEL—Module block size allsteel forms with headers, long spans, or side by side gang assembly.



SOLID LINTEL—Module block size can be produced by "Form-crete" method in same forms as hollow lintels by removing center insert.



SHOWN ABOVE:
"Form-crete" DOUBLE "T" semi-portable all steel form.

*Trade name for Food Machinery and Chemical Corporation's especially designed, engineered and manufactured steel die-forms for moulding prestressed concrete construction units.

FLORIDA DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION
P. O. BOX 1718, LAKELAND, FLORIDA

fmc

PF-2

MAIL THIS COUPON TODAY

SEND "FORM-CRETE" INFORMATION ON ITEMS CHECKED.

Name_____

Address_____

City_____ State_____

☐ Double "T" ☐ Bridge Beams ☐ Square Pilings ☐ Hollow Lintels ☐ Solid Lintels

Free—PRE-STRESSED FOLDER

Showing how long precast, reinforced concrete channel slabs are used in construction

bars are covered by not less than ½ in. of concrete, and the welded fabric is centered in the web.

Strength test reports on the short span slabs may be required by the architect or engineer as evidence of the manufacturer's ability to produce concrete of the specific strength, or slabs selected at random may be tested under load. Slabs with 2¾-in. legs up to 6 ft. long, and with 3¾-in. legs up to 8 ft. long, shall not fail under evenly distributed loads less than 250 lb. per sq. ft.; slabs with 3¾-in. legs from 8 ft. to 10 ft. under loads less than 200 lb. per sq. ft., and with 4¾-in. legs up to 12 ft. under loads less than 175 lb. per sq. ft.

Plant Layout-Operation

The Carter-Waters plant, which is comparatively new, was designed for large scale concrete block and precast operations at the time of construction in 1951 and 1952. More under-cover space has been a constant problem, and six additions have been made to the original building in these years since erection. A system of overhead monorails and Budgit and Yale hoists of varying capacities serve the casting department. The maximum length of precast units that can be handled on a production basis at this time is 38 ft.

Long spans are handled on a daily cycle basis. Lift loops are placed in each span. After lifting from the forms, they are set on dollies and transferred to curing storage. Sales are made on an f.o.b. job basis, and loading is done from yard storage to semi-trailer trucks, using a mobile crane.

Short span slabs present no difficult transportation problems as they are loaded at the plant with fork trucks and unloaded on the job mainly by hand. However, some handling precautions must be observed. When delivered to the job by truck, they are placed in strapped bundles and may be taken from the truck only by a fork-lift or a rigid jig; not by a rope or cable sling. The strapping may be removed on the truck and the slabs handed down individually. Slabs on the job are stacked only on edge with lumber strips in between to keep them clean and are not placed in piles one over the other.

On the long span slabs, protective lumber stripping is used to separate each layer of slabs. When they are unloaded at the job, the legs are placed down and level on two bolsters which are set on the outside quarter points. Slabs which are stacked one above the other are required to rest on wood separators placed directly in line with the bottom bolsters.

Loading operations at the plant are planned to place slabs in proper numbered and labelled sequences to agree with shop drawings so that there will be no confusion in handling by the contractor's men on the job. This is considered a very necessary and important part of delivery service.

A better building at a lower cost is the slogan used in offering this product to the building industry. Besides saving time-consuming and costly operations on the job by elimination of jobsite form work, including shoring, reinforcing steel placement, concrete pouring and stripping, there are added advantages of greatly expanded freedom of working areas, non-interference with other building operations, and losses of time through unfavorable weather. Lost time on a construction project, big or little, is an ever present worry to the general contractor whose profit is closely linked to his ability to get things done. The precast concrete industry is making substantial contributions to better buildings at lower costs.

Headquarters for the combined operations of the Carter-Waters Corporation are in their own building at 2440 Pennway, Kansas City, Mo. The officers are: Albert R. Waters, president; W. E. Beanway, vice-president and general manager; Geo. W. Kulhavy, secretary; John Bethel, assistant secretary; Paul J. Kirner, treasurer; R. L. Coleman, production manager; and R. E. Walker, general sales manager.

Short Course School

THE TENTH ANNUAL SHORT COURSE on Concrete and Concrete Aggregates, sponsored jointly by the National Sand and Gravel Association, the National Ready Mixed Concrete Association, and the University of Maryland, will be held the week of November 14 at the University of Maryland, College Park, Md. The course will include general instruction on laboratory practices. For more detailed laboratory instruction, the associations are offering special limited-attendance short courses periodically. The first such course was held last April, and it is expected that the next will be in the spring of 1956.

Subjects to be covered at the November meeting include aggregates, concrete, cements, and such other related subjects are admixtures, lightweight aggregates, blending, etc. Time will be divided among lectures, discussion sessions, and problem sessions.

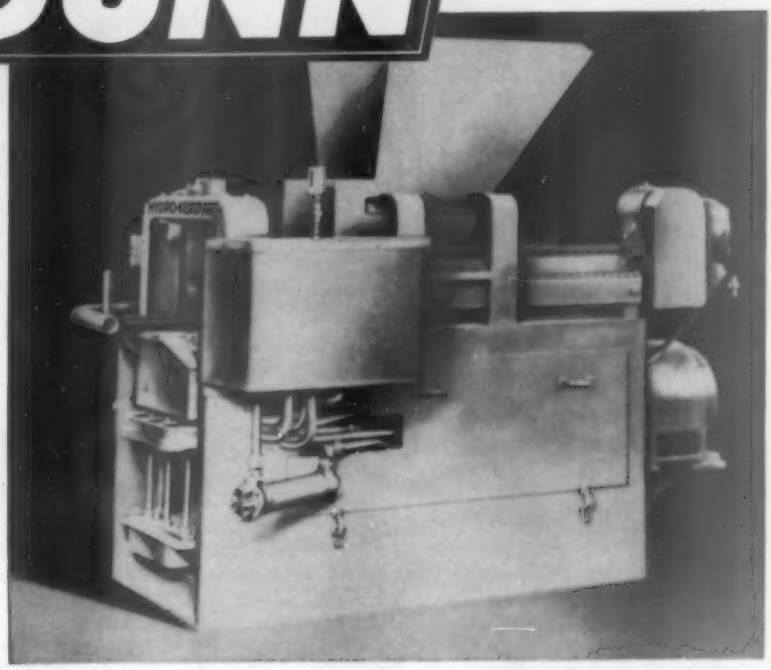
Concrete Warehouse for Acid

AN ACID STORAGE WAREHOUSE, incorporating unusual fire-control precautions, is being designed for the Army Corps of Engineers near San Bernardino, Calif., by Benedict, Beckler and Kocher, Los Angeles, Calif., architects. Concrete masonry walls of 12-in. minimum thickness will be used throughout the building; the floors will be of reinforced concrete. Overall cost for the building is estimated to be in excess of $200,000.

Building Ready Mix Plant

NEW YORK COAL CO., Columbus, Ohio, has announced plans to construct a ready-mixed concrete plant in Ironton, Ohio. George Johnson, who has been with the Waverly unit of the company's Basic Construction Materials Division, will be superintendent.

DUNN



HYDRO-KORPAK BLOCK MACHINE

Priced to fit modest budgets, the Hydro-Korpak brings the production economies and operating efficiency of advanced engineering within easy reach of average sized plants, or those with normal sales potentials. Its design is based on 50 years of block-machine building.

Two-way packing—vertical and lateral—results in blocks of extreme density and superfine quality. It's unique with Korpak, because only Korpak has oscillating cores.

1-man operation . . . hydraulic movements . . . electrical controls. 2¼ tons of machine self-contained to occupy only 33 square feet of floor space. Available on sale or lease.

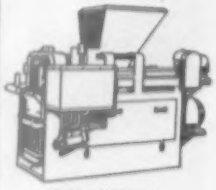
Direct-to-user selling through factory demonstration, with resultant savings passed along to owners. You are invited to Holland—as our guest—to see the machine in operation and get information first hand. Meanwhile, write for descriptive catalog.

W. E. DUNN MFG. CO. • 544 W. 24th Street • HOLLAND, MICH.

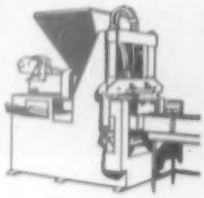
IN CANADA: Dunn Masonry Machinery, Ltd., 996 Dundas Hiway, Cooksville, Ont.

BUILDER OF CONCRETE PRODUCTS MACHINERY SINCE 1904

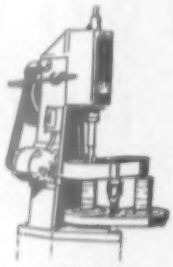
KORPAK BLOCK MACHINE



HYDRO-KORPAK BLOCK MACHINE



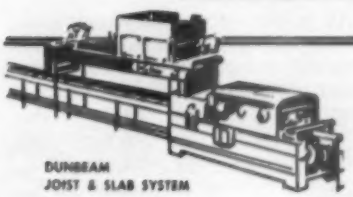
TWIN-PAK BLOCK MACHINE



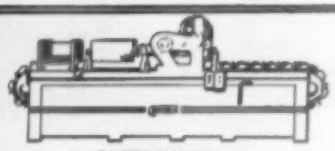
CHAMPION DRAIN TILE MACHINE

DUNN "AUTOMATIC" DRAIN TILE MACHINE

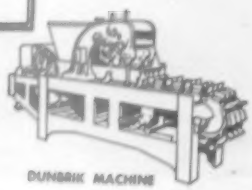
DUNTILE MACHINE



DUNBEAM JOIST & SLAB SYSTEM



CAVITEX MACHINE



DUNBRIK MACHINE

Mixer trucks are washed after each day's run and lined up in the yards. Note radio tower rising above batching plant

TWO-WAY RADIO Equipment On All Mobile Units

• Ready-Mixed Concrete Co., Inc., Ft. Lauderdale, Fla., opens second plant at Hollywood. Company has outstanding safety, advertising and employe relations program

By HUBERT C. PERSONS

INCREASING DEMAND has led the Ready-Mixed Concrete Co., Inc. of Ft. Lauderdale, to open a second plant at Hollywood, Fla., eight miles south. The company operates 18 mixer trucks from the Ft. Lauderdale plant and seven from the Hollywood plant. The new operation, although under the same ownership as the Ft. Lauderdale Co., will be known as the Ready-Mix Concrete Co. of Hollywood, Inc.

Batching plant and some of the later model mixer trucks operated in Hollywood, Fla.

Eighteen of the mixer trucks at the Ft. Lauderdale plant are 4½ and 6-cu. yd. Hi-Lo agitator trucks made by the Concrete Transport Mixer Co. of St. Louis. The last seven purchased are Rocket revolving drum mixer units made by the same company. With the exception of the Rockets, the entire operation is premix. Eight units of the fleet have a Marmon-Herrington "all-wheel drive." The trucks at the Hollywood plant are similarly equipped but are transit mixers instead of premix.

Two-Way Radio

All trucks, service cars and automobiles used by executives of the company are equipped for inter-communication through a two-way General Electric radio system. There is also a "Teleautograph" system connecting the dispatching office with the batch-

(Continued on page 174)

Thin Section, Precast Concrete Roofs

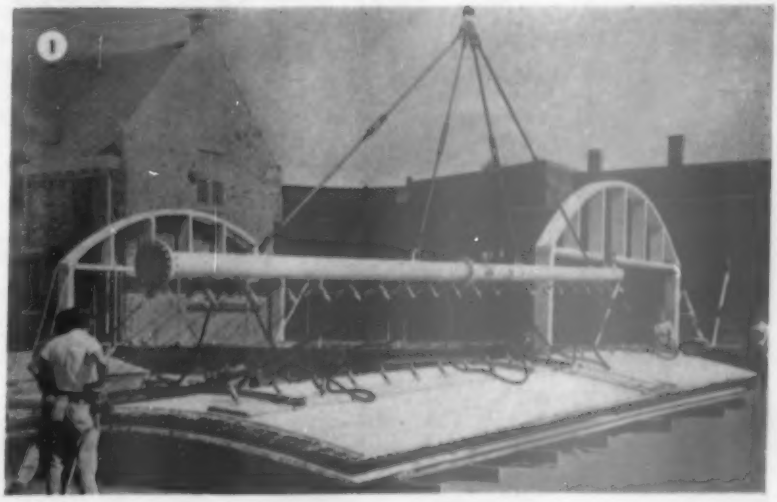
•Vacuum Concrete, Inc., Philadelphia, Penn., has developed a curved precast concrete roof. The roof is light, fire-proof, and erection cost is low

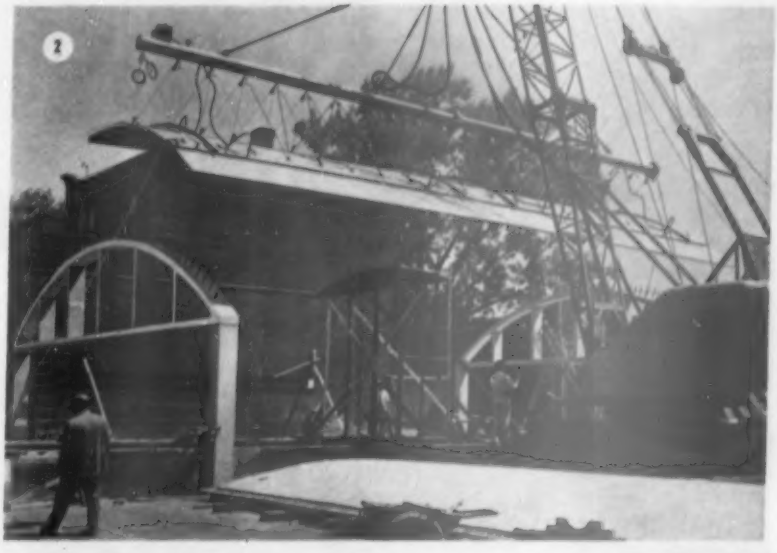
A NEW TYPE OF CONSTRUCTION was recently employed in Philadelphia, Penn., when the St. Joseph's House swimming pool was recently completed. The Ortega-Billner curved thin-shell, precast, reinforced concrete roof was used in this structure, the first time anywhere in the world.

The roof was precast in halves on the ground, vacuum-lifted into position, and connected by poured-in-place joints. The resulting roof is light, economical and fire-proof. Curved elements, approximately 20- x 49-ft. and 2½ in. thick, were cast on top of one another, reducing costly form work. After only three days of curing, the top element was raised by the vacuum lifter onto the precast trusses. The lifting device was invented by Karl P. Billner, president of Vacuum Concrete, Inc., widely known in the concrete products industry for the vacuum process of reducing moisture content of precast concrete.

This precast concrete roof construction method should prove economical for housing projects, factories and warehouses due to the available maximum clear area with a minimum of formwork.

George J. Hartman, Vacuum Concrete, Inc., was in charge of engineering on this job. Joseph R. Farrell, president of Joseph R. Farrell, Inc., was responsible for construction on this project.





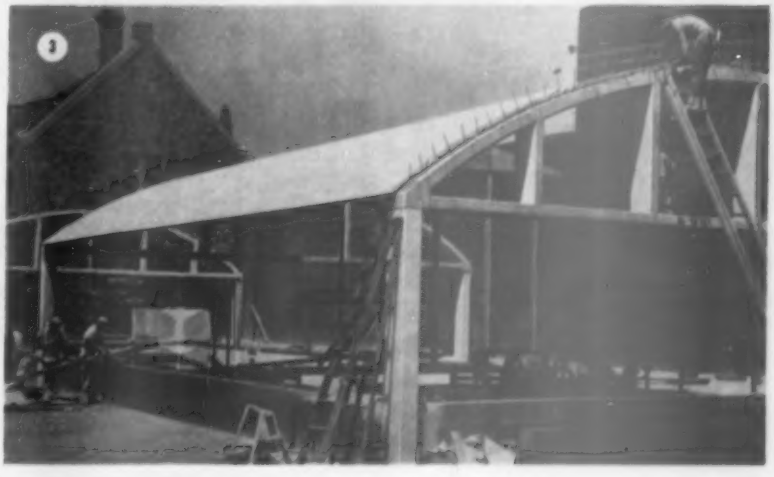


Fig. 1: Vacuum lifter, attached by atmospheric pressure, is about to raise the top shell from the stack. Note the 10-in. dia. pipe which serves both as a structural member and as a vacuum chamber, the pulleys, the 14-in. dia. wire rope, and the plywood suction pads

Fig. 2: Lifter lowering shell onto trusses. The lifter holds the shell at the proper angle for correct positioning on the truss supports. Note truss dowels

Fig. 3: Shell in position on trusses. Half shell is now in position. When the other half shells are placed, the poured-in-place joints are made

Dumptor hauls along trestles .

. . . or tunnels

without turning

Shuttling back and forth between the loading unit and dump area, Koehring Dumptor travels round-trip without turning. It operates with equal ease in both directions on overhead trestles, in confined underground mines, on open-pit ledges and narrow haul roads. Dumptor gets this unique no-turn advantage through a constant-mesh transmission that gives the same 3-speed travel in either direction.

Every turn eliminated cuts 15 seconds off cycle time. This adds up to a substantial increase in yards hauled per hour. For example, by saving only 2 turns, time studies prove that Dumptor increases hourly yardage output more than 10% on an average 1,000-foot haul.

One-second gravity-dumping also maintains a high rate of production. To dump, operator trips body-release lever, and the 6-yard body instantly tilts 70°. One second later the load is out, and Dumptor is on its way back for the next load. There's no 15 to 25-second wait for slow-acting hydraulic or electric body hoists. What's more, gravity-dump never balks, never wears out.

To learn what these Dumptor advantages can mean in increased production and lower hauling costs on your work, call your Koehring distributor, or write for Dumptor® catalog.

KOEHRING COMPANY

Milwaukee 16, Wisconsin

CK440 Subsidiaries: PARSONS • KWIK-MIX • JOHNSON

"Repeater" automatically re-batches any mix selection

At the turn of a dial and push of a button, this Johnson automatic Batch Controller selects any one of 120 different size and type batches of aggregates and cement. It weighs out any combination of materials you set up on the central dial-scale control panel . . . and automatically repeats any batch selections for a pre-determined number of times.

The electric-control, 120-mix-selector panel provides for concrete of various strengths in any combination of materials, in ½ to 2 cubic yard batches. For each size batch there are individual selections for 3 to 6-inch slumps. Dial system makes it easy to change from one mix selection to another. To get any size or type of batch, operator merely turns the selector dial, sets the "repeater", pushes the "start" button . . . and the plant weighs out fast, with pinpoint accuracy. During the batching cycle, a lock prevents accidental change of the mix selector.

Nine material weigh-dials on the control panel have individual pen-recorders. Exact weight of each batch is automatically graph-recorded. Johnson transit-mix plant shown here has: six 5000-lb. aggregate batchers (two with automatic moisture-compensators) . . . a 3000-lb. cement batcher with dual fill valves for selecting 2 types of cement . . . a 2000-lb. water weigh-batcher, and a 5-lb. (80-oz.) air entraining admix batcher. All are fully automatic.

Whenever you plan a new plant . . . or want to modernize an existing set-up, look into the increased efficiency you can get with Johnson equipment. You'll find your Johnson distributor is at your service . . . ready to help at any time.

T9

C. S. JOHNSON CO. CHAMPAIGN, ILLINOIS

Koehring Subsidiary

SHAKE CLEAN FAST

WITH THE

NATIONAL Car Shaker

Patented

- Soon pays for itself
- Keeps your men out of R R cars
- Simple one-man operation
- Quickly and easily installed in your plant

Write for a list of users in your area

National Conveyor & Supply Company

356 N. Harding Ave. Chicago 24, Illinois

ROCK PRODUCTS

IS READ BY THOSE WHO BUY YOUR PRODUCTS

●

Concrete Association Officers

VERNE FRESE, Layrite Concrete Products of Seattle, Inc., was recently elected president of the Concrete Products Association of Washington. J. W. Sullivan, Bremerton Concrete Products Co., Bremerton, was elected vice-president; J. B. Lundberg, Tacoma, secretary; and H. H. Stevens, Vancouver, treasurer. George P. Ducey, Associated Sand and Gravel Co., Everett; C. H. Norton, Wenatchee, and W. S. Wilson, Seattle, were named directors.

Texas Industries Promotions

ED C. JANCIK, formerly sales manager, has been appointed general manager for Texas Lightweight Aggregate Co., a division of Texas Industries, Inc., Dallas, Texas, with plants in Rosenburg and Stafford, Texas. B. J. Alexander has been named general sales manager of Texcrete Co., where he has been serving as sales manager, and Walter D. Rosenberg, Jr., has been appointed production manager.

Joins Concrete Block Firm

LARRY M. CONDREY, formerly design and production engineer for the Blocked-Iron Corp., Albany, N. Y., has joined the sales and engineering staff of the Cedar Rapids Block Co., Cedar Rapids, Iowa. A civil engineering graduate of Purdue University, Lafayette, Ind., Mr. Condrey previously served as structural engineer for Precast Concrete Products, Chicago, Ill., and the Portland Cement Association, Indianapolis, Ind. He is a member of the American Concrete Institute, National Society of Professional Engineers, and the National Concrete Masonry Association, where he served on the Technical Problems Committee from 1949 through 1952.

Larry M. Condrey

Sales Representative

BREWSTER MORGAN has been appointed sales and public relations representative for the Pacific Concrete and Rock Co., Honolulu, Hawaii, according to an announcement by Louis P. Price, president. Mr. Morgan was born in Honolulu and on August 1 became associated with Pacific Concrete and Rock Co., which was established by Mr. Price four years ago. The firm operates a quarry, a batching plant and has a fleet of 17 transit-mix trucks. Rex Clay has been named office manager. He was formerly of Los Angeles where he had his own practice as a C.P.A.

Elected President

FRED C. WINKLER, JR., has been elected president of the Stockton Building Materials Co., Stockton, Calif., a subsidiary of Calaveras Cement Co., San Francisco, Calif. Formerly vice-president and manager, Mr. Winkler succeeds Wm. Wallace Mein, Jr., who has resigned to devote more time to his duties as president of Calaveras Cement Co. Arnold M. Ross was elected to the newly created position of chairman of the board. L. P. Albert was named treasurer, and Lloyd L. Allen, secretary.

Chairman of the Board

S. O. MCFALL, president of Universal Sewer Pipe Corp. and U. S. Concrete Pipe Co., Cleveland, Ohio, has been elected chairman of the board of the two firms. He has been succeeded as president by R. F. McFall, vice-president. R. H. Exley, vice-president and treasurer, was elected executive vice-president and treasurer; J. J. Satow, secretary, and H. B. Bodenhamer, general sales manager.

Division Vice-President

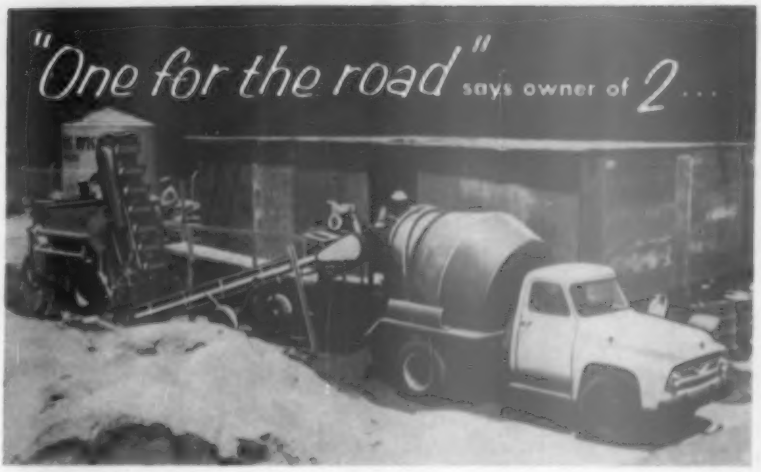
GLENN A. HUTT has been appointed vice-president of the building products division of Ferro Corp., Cleveland, Ohio. He has been associated with the firm for 21 years and has been serving as vice-president of advertising and market research.

Celotex Vice-President

GERRARD SNYMAN has been named vice-president of The Celotex Corp., Chicago, Ill. He has been managing director of Celotex Limited, English subsidiary of Celotex, since 1951, and will have charge of foreign operations.

Pipe Plant Manager

JAMES EHLERT has been appointed plant manager of the Concrete Pipe Co., Sandusky, Ohio, to succeed Russell J. Dann who has resigned to devote more time to other business interests.



WILLARD READY-MIX PLANTS

WITH A COMBINED CAPACITY of 400 cu. yds., these two all Willard plants give Earl Ladd Ready-Mix Concrete Co., the ability to handle any city job and to move hundreds of miles out of town for the high profit jobs that no one else can touch.

PLANT 1. 150 C. Y. CAP. ***"Have tux and will travel"***

Consists of Willard Weigh Batch Loader, Mixer Loading Conveyor and three 3 cu. yd. Willard Truck Mixers. Uses sack cement. No other equipment is required; one operator does the job.

PLANT 2. 250 C. Y. CAP. ***"Stay at home set up"***

Consists of electric operated Willard Weigh Batch Loader, Cement Silo, Mixer Loading Conveyor and 3 to 5½ cu. yd. Willard Truck Mixers.

Whether you need a stationary plant or want to contract for public works jobs it will pay you to investigate the "Willard Way." Write for literature.

Manufactured in Los Angeles, California and Galion, Ohio

WILLARD CONCRETE MACHINERY SALES CO.

11700 Wright Rd., Lynwood, Calif.
Member T.M.M.B.

READY-MIX *"the Willard Way"*

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

The Quinn Standard

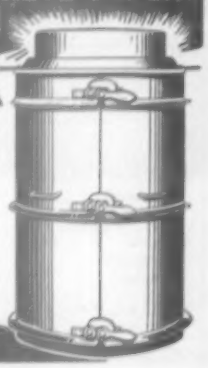
Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

■ **QUINN HEAVY DUTY PIPE FORMS**

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell and pipe in any length desired.

WRITE TODAY for complete information and estimates.

Also manufacturers of QUINN CONCRETE PIPE MACHINES



Quinn WIRE & IRON WORKS
SIOUX CITY, IOWA

Chemical Resisting Concrete Products

• Treat concrete products in Netherlands experiments with a fluorine-containing gas to make them resistant to chemicals

By J. VANDER EERDE*

OWING TO THE HIGH PERCENTAGE of lime-compounds (free lime) in the cement, concrete products are not proof against chemically active liquids or gases. Greater resistance to these liquids and gases by using blast-furnace-cement, trass cement, and bitumens has been tried, but they are not a solution of the problem.

The Ocrietfabriek N. V. in Baarn, Netherlands has tackled this problem from the chemical side. The concrete products are treated with a fluorine-containing gas, that reacts with the free lime-compounds and converts them to stable compounds.

As the treatment can take place in a gas-charged tunnel, one can control the penetration of gas by altering the pressure and the treatment-time. It is therefore possible to adapt the penetration of the treated layer to the requirements of the concrete product being treated. A complete penetration is possible, if required. This process, protected by patents in all civilized countries, is designated by the inventors by the name, "TO OCRATE," which is an international trade mark.

In addition to the increase in resistance to chemically active liquids and gases, there are still other advantages, such as an increase of strength, greater density, and ability to withstand mechanical abrasion.

In view of the importance of the invention (in fact, it is considered a revolutionary alteration in concrete technology), the "Dyckerhoff Portland Zementwerke AG, Wiesbaden-Amöneburg, Germany" studied the results achieved by Ocriet and published it at a meeting with scientists.

The controlled tests were conducted in the laboratory of this German cement plant under the direction of Dr. W. Wittekindt, the chief-chemist of this concern. From this report by Dr. Wittekindt, the following data has been taken:

"In addition to acid-resistance of ocrated concrete, there are further advantages of a technical nature arising from the increased strength of the concrete, as will be evident from the following examples.

"A concrete made from portland cement Z 225 with 0-3 mm. Rhine sand, 1:3.5 mix by weight, plastic with 15 percent water, water/cement ratio 0.68, in prisms of 4 x 4 x 16 cm. was stored for three days in a moist condition and then in air. A part of the prisms was ocrated. Strength tests were performed at six weeks:

Untreated

Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
50	206

Ocrated

Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
99	425

"Portland blast furnace cement Z 225, with the same aggregates and a mix of 1:5 by weight, of "earth-moist" consistency with 6 percent water, water/cement ratio 0.36, was subjected to the same treatment as above and gave the following results at six weeks:

Untreated

Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
27	88

Ocrated

Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
53	211

"Concrete made with "Dyckerhoff-Weiss" cement, 1:3.5 mix by weight, with the same aggregates, "earth-moist" with 8 percent water, water/cement ratio 0.36, gave the following values:

Untreated

Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
40	232 6 weeks
44	236 8 weeks

Ocrated

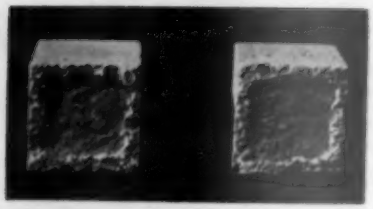
Tensile Strength in Flexure kg. per sq. cm.	Crushing Strength kg. per sq. cm.
82	518 6 weeks
83	586 8 weeks

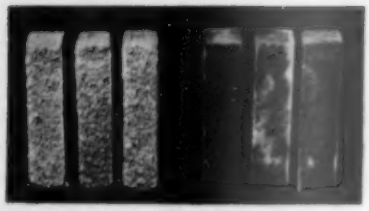
"Abrasion resistance was determined by means of the Böhme abrasive disc for an "earth-moist" concrete made

(Continued on page 168)

*Gen. Mgr., Ocrietfabrik N. V., Baarn, Netherlands.

TABLE I	Na_2SO_4 25g. SO_3 per l.		Acetic Acid 10 percent sol.		Lactic Acid 5 percent sol.	
	tensile strength in flexure	crushing strength	tensile strength in flexure	crushing strength	tensile strength in flexure	crushing strength
PZ 225						
untreated	84	309	34	121	43	153
ocrated	111	366	100	344	99	349
EPZ 225						
untreated	81	288	31	135	30	103
ocrated	122	452	110	377	99	455
Dyckerhoff-Weiss						
untreated			32	147	41	158
ocrated			97	351	98	323





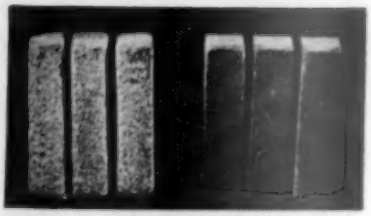


Fig. 1, above: "Ocrated" concrete prisms in two halves, the internal area of which was attacked by hydrochloric acid but the external zones are unharmed. Fig 2, center: concrete prisms stored for eight weeks in 10 percent solution of acetic acid; left, untreated, right "ocrated." Fig. 3, below: Concrete prisms stored for eight weeks in a 5 percent solution of lactic acid; left, untreated, right, treated

★ ★ ★ ★ ★ ★ ★ ★ **STEARNS** ★ ★ ★ ★ ★ ★ ★ ★

MANUFACTURING COMPANY · INC.

ADRIAN • MICHIGAN

COMPLETE CONCRETE PRODUCTS PLANT EQUIPMENT • THE STANDARD OF PERFORMANCE

"Cleaned with a whisk broom, putty knife and . . .

EDI-COTE 103 in half the time!"

says owner* of this 17 year old mixer that looks like new.

EDI-COTE #103 is a revolutionary new release agent that prevents concrete from bonding to mixer blades and parts. EDI-COTE #103 eliminates the use of air guns and sledge hammers in the daily clean-up. EDI-COTE #103 creates a non-hardening film which prevents the forming of a bond between concrete and metal. It adheres rigidly and will not dissipate due to chemical action or abrasion. One application of EDI-COTE #103 will remain effective throughout the longest working day. EDI-COTE #103 can be applied with brush or spray. Shipped in 55 gallon drums. 5 gallon cans available for trial shipments only. Order EDI-COTE # 103 today!

* Frank Erdman & Son, Milwaukee, Wisconsin

Edick LABORATORIES
427 West National Avenue
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For further information on EDI-COTE #103, see your NCMA Technical Bulletin No. 2, Attachment No. 1, March 3, 1955.

Add a New Profit-Maker
increase your volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.

Only Small Investment Required!
The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK & BLUM
Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

CHEMICAL RESISTING

(Continued from page 166)

with "Dyckerhoff Doppel" (Z325), 1:3.5 mix by weight, with 0-3 mm. Rhine sand and 6.6 percent water, water/cement ratio 0.30; part of the tiles had been ocrated.

"After the abrasive load had been applied four times (in accordance with DIN DVM 2108) the following losses were ascertained:

Untreated	Ocrated
cu. cm. per sq. cm.	cu. cm. per sq. cm.
0.156	0.102

"The loss due to abrasion in the case of the ocrated concrete was therefore only 66 percent of that occurring in the case of the untreated concrete.

"The success of the ocrate-method is demonstrated in a particularly striking manner when objects made of concrete are placed in aggressive solutions.

"Concrete was made with different kinds of cement in a mix of 1:3.5 by weight, using 0-3 mm. Rhine sand and the addition of 15 percent water, the water/cement ratio being 0.68.

"The 4- x 4- x 16-cm. prisms were stored for one day in moist air, two days under water and then in air. Ocrating was carried out at 28 days. At six weeks the prisms were placed in the solutions which were renewed every 14 days.

"After keeping the prisms immersed in these solutions for a total period of six weeks, a strength test was carried out, the results of which are given in Table I, page 166.

"Prisms of the same origin, which had been stored in air from the third day onward, were tested at the same time.

"Figs. 2 and 3 show untreated and treated prisms after storage in the acids. The examples illustrated and the high strength of the concrete after six weeks' storage in aggressive solutions (Table I) adequately demonstrate the immunity of the concrete."

It is not feasable to explain briefly the numerous possibilities, which are opened by this invention for the concrete, artificial stone and asbestos-cement industry.

We only suffice it to mention some products, for which the importance at once strikes the eye:

CONCRETE PIPE FOR SEWERAGE, DRAINAGE ETC:

In many cases, concrete pipe may be laid into less or more strongly active soils, whereas practically all substances which can be moved through the pipe, contain active liquids, which are detrimental to concrete.

ARTIFICIAL STONE PRODUCTS:

It is generally known, that these products become coarse in the long run owing to the corrosion of the ce-

ment by a few chemically-active materials among which even hard water must be reckoned.

DRAIN PIPES:

Owing to the necessary porosity of these pipes and to the active character of most of the ground water, the corrosion is particularly noticeable.

CONCRETE PILING:

From its very nature, concrete piling is practically always used in aggressive ground (peat, marsh, clay soils).

CONCRETE AND CEMENT TILES:

Applied as floors in the chemical industry and in a lot of other places, the cement tile are continuously exposed to chemical action. Also in places, where this is not a factor, an increase of the resistance to abrasion will lead to a longer life.

LIGHTWEIGHT CONCRETE:

The increase of — (in proportion to normal concrete) — strength while retaining the low weight, opens the way to new construction possibilities.

We are on the threshold of a revolution in the domain of concrete and we think it sufficient to end this explanation with the pithy declaration concerning "ocrating" by Prof. Dr.-Ing. A. Kleinlogel, the author of the well-known book "Einflusse auf Beton" ("Influences on Concrete"):

"I am very much impressed by the new and revolutionary invention of "ocrating," and I can congratulate the inventor personally as well as the Ocriet-factory N. V. with all my heart. With this development, concrete-quality has been raised to a level that, up to now, could only be imagined."

Floor Panel Heating

THE NATIONAL CONCRETE MASONRY ASSOCIATION has published a 20-page booklet, prepared by J. Raymond Carroll, heating and air conditioning consultant, Urbana, Ill., dealing with warm-air flow panel heating systems using hollow concrete masonry units. Entitled "Principles of Warm Air Floor Panel Heating," it discusses various design aspects common to such systems regardless of the sizes and types of hollow masonry units used. The booklet also discusses the means whereby the body loses heat to the surrounding air and the deficiencies of older methods of heating, due primarily to the fact that body heat loss is not considered in maintaining indoor temperature. Various duct methods of conducting forced warm air under the floor panels, furnace location, problem of return air vents, and design and installation considerations for multiple story design are discussed generally, The manual is available by writing to the Association at 38 S. Dearborn St., Chicago 3, Ill.

YOU CAN BUY A BANTAM

ANY WAY YOU WANT IT!

There's a model Specially designed for Your jobs!

Whether you're loading out aggregates, feeding batchers or crushers, stock piling, or handling concrete, there's a BANTAM to fit the KEY SPOT on that job! Schield Bantam builds just one size machine . . . builds more of them than anyone else . . . builds them to do more jobs for you with any of 9 different attachments.

For special applications or routine jobs, there's a BANTAM that can do your work faster with more profit for you! Find out about a BANTAM before you buy any ⅜ yd., 5-6-7 ton shovel-crane!

WE HAVE A NEW 7 TON BANTAM

Now, to let you handle bigger lifts, Schield Bantam offers a 7-TON CRANE on Heavy-Duty "300" Crane Carrier! You can also get 5-ton (Crawler) and 6-ton (Carrier and Self-Propelled) cranes to fit your job needs . . . the most complete crane line-up in the ⅜ yd. field!

BP-12

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WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS

CLIP . . . Mail today for more information about the BANTAM.

SEND INFORMATION ON:

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- ☐ New 7-Ton Bantam
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Company _____

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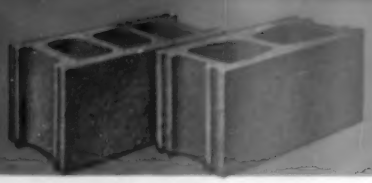
BESSER VIBRAPAC



Gives You MORE!

The growth of the concrete block industry coincides with the growth of the Besser Manufacturing Company. 50 years ago, Besser made the first concrete block machine. Since then, the company has devoted its constant and untiring efforts to producing better block machines, pioneering new types and improving production methods. Today — the Automatic Vibrapac is the result of that half-century of pioneering and developing. The machine gives you MORE . . . more power, more smoothness, more ruggedness, and, what every block plant operator is primarily interested in, more block production. No doubt about it — the Automatic Vibrapac is the world's leading concrete block machine — a PROFIT MAKER for block plants everywhere.

MORE power

The Automatic Vibrapac provides unidirectional vibration from two 10 horsepower, high starting torque vibrating motors — DOUBLE the horsepower of any other block machine.

MORE production

The famous Besser cam and roller principle assures maximum block production. The slow revolving cam, with a roller riding on its surface, delivers power with pin point precision and with steady, uninterrupted regularity.

MORE smoothness

The Vibrapac is equipped with gravity actuated block moving weights which assure much smoother delivery of the finished block at high speeds.

MORE ruggedness

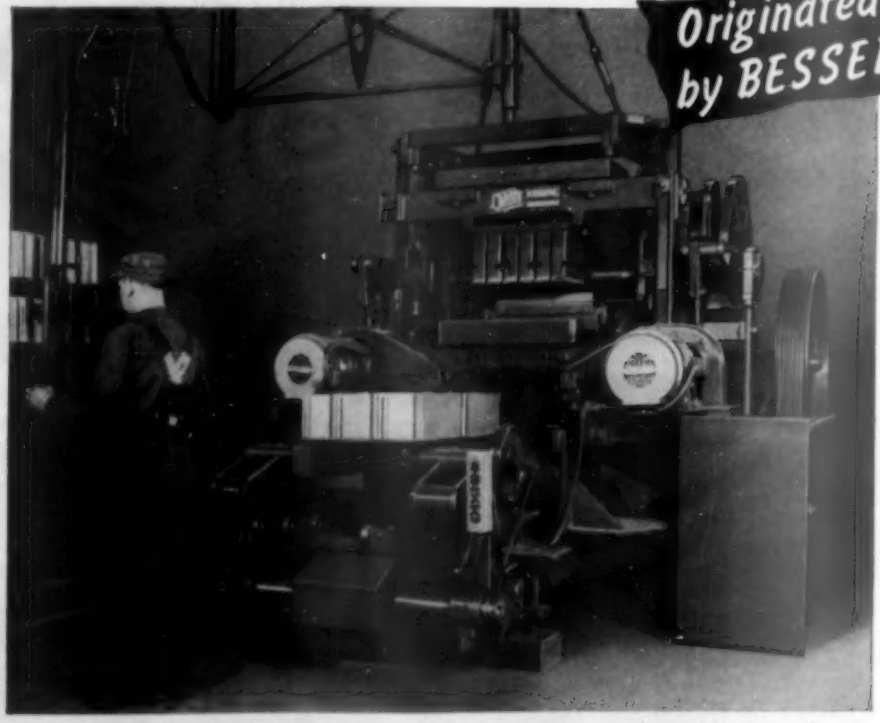
The machine frame of the all-steel electrically welded Vibrapac is made of 1½" thick steel—almost unbelievable, but it's a fact. That's why the Vibrapac is able to produce block, day-in and day-out, without interruption — for YEARS.

Watch VIBRAPACS Work

Step into any Vibrapac block plant and see high quality block made, *automatically*. Notice there are no lost motions and no time is wasted. Pallets and mixed materials are fed automatically. As block are completed, they are quickly transferred to the racks. No manual lifting. Off-bearer merely guides the power hoist.

●

Vibrapacs are versatile. They make ALL types and sizes of high-quality masonry units on ONE set of Plain Pallets. Vibrapac Block are specified by progressive architects — used by leading contractors—produced and sold by leading concrete products plants.



See the BESSER Exhibit at the NATIONAL HOUSING CENTER Washington, D. C.

Your profits depend largely on the uninterrupted production of high quality masonry units. The Automatic Vibrapac enables you to reach this goal. It produces block of exact height and uniform density on a continuous production line. Three 8"x8"x16" modular units (or equivalent in other sizes) are made at a time on one Plain Pallet. No machine operator is required.

BESSER COMPANY

BOX 133 • ALPENA, MICHIGAN, U. S. A.

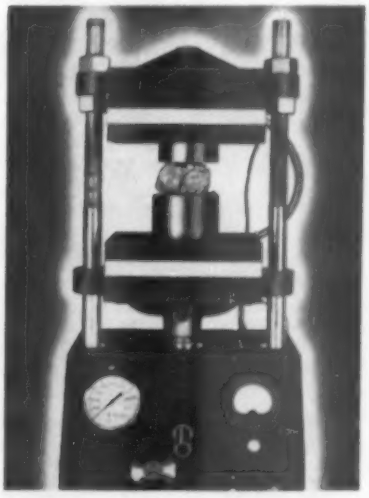
Complete Equipment for Concrete Block Plants

A 7307-1F BCB

NEW MACHINERY

Slide-Off Block Unloader

ADAM BLACK AND SONS, INC., 300 Tonnele Ave., Jersey City, N. J., has introduced the "Slide-Off" block unloader which automatically unloads concrete and cinder block and other building materials. It is especially adapted to severe and uneven ground conditions through the use of a "floating" body hinge and retractable rear body forks which follow the contour of the ground during the unloading operation. The hinge also allows additional tipping angle if the truck is backed up an incline. Power down in the hoist, as well as power up, locks the body at the desired angle. A special load brake eases the load to the ground when sufficient tipping angle is reached. The abrasive resistant steel floor accommodates 12 block across its width or cubes of block six deep. The addition of side boards enables dumping loose materials. The unit is available in six sizes to meet individual requirements.



Hydraulic Laboratory Press

WABASH METAL PRODUCTS CO., 1594 Morris St., Wabash, Ind., has introduced Model 12-10, a hydraulic laboratory press designed to crush concrete block, brick, pipe, etc., for determining tensile strength or tons pressure required for crushing. Full 12-ton pressure is exerted by a manually operated hydraulic mechanism. Precision bored guide holes assure parallel alignment of the platens, which have a work area of 7 x 10 ft. Heated platens are standard equipment, for applying pressure under elevated temperatures where desired. Pressure can be applied slowly or rapidly and released instantly. The hydraulic mechanism is enclosed in an accessible console type cabinet. The press is also available in 30- and 50-ton capacities.

Transit Mixer

WILLARD CONCRETE MACHINERY SALES CO., 11700 Wright Road, Lynwood, Calif., has announced the 6-cu. yd. Hydromixer with a 193-in. wheelbase, which handles 6½ cu. yd. of concrete with less than a 32,000-lb. load on the rear tandem axles. It features a hydraulic drum drive which is powered by a front-mounted, two-speed power take-off. Charging, mixing and discharging are controlled by a two-way hydraulic valve, and there is said to be no rollback or surging with the hydraulic system.

Mobile Batching Plant

STANDARD STEEL CORP., Los Angeles, Calif., has announced a mobile concrete batching plant, designed to produce enough concrete in one hour to pave a 500-ft. strip of 12-ft. highway. The unit is the first of a complete line of concrete construction equipment planned by the company. The mixer is more than five stories high, weighs 30 tons, and can be transported, disassembled, on three flat-bed trucks. Only one man is needed to operate the plant.

The unit includes a 550-bbl. cement silo and a four-compartment bin for storing 150 tons of aggregate.

Your Customers will say...

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

CEMENT COLORS BY WILLIAMS

Here you have a choice of 18 shades —6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

MORTAR COLORS BY WILLIAMS

Here you have a choice of 5 different shades — one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

Write today for color samples and complete technical information on how Williams Cement and Mortar Colors give you superior results. Address Dept. 10, C. K. Williams & Co., Easton, Pennsylvania.

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
East St. Louis, Ill. Easton, Pa. Emeryville, Cal.

ARE YOU PROFITING BY THE SALE OF LINTELS AND SILLS ?

If you are not, it may be because you are not fully familiar with the new and effective way of producing these wanted parts on the

KENT LINTELATOR

With this machine, of which hundreds are already in use, you can expand your sales and profits without increasing your sales force.

Once the availability of machine-made lintels and sills is made known, builders buy them readily as their quality and desirability is immediately apparent.

Why should builders purchase more expensive steel lintels to be installed only by steel erectors when they can obtain reinforced concrete lintels that their own masons install without delay at much less expense?

Why also should you delay looking into the promising possibilities of this machine which eventually will be found in every block plant?

The KENT MACHINE COMPANY
CUYAHOGA FALLS, OHIO
CONCRETE PRODUCTS MACHINERY SINCE 1925

COLOR MAKES THE SPLIT BLOCK
USE: PURE—STRONG—CLEAN COLORS
11 REDS—from peach to burgundy
5 YELLOWS—from lemon to buff
15 BROWNS—from beige to chocolate
PLUS BLACK — GRAYS — BLUES — ORANGE
AND TWO DISTINCTIVE TYPES OF GREEN
Warehouses at all Important Points of Distribution

FRANK D. DAVIS COMPANY
2704 Santa Fe Avenue, Los Angeles 58, California
P.O. Box 292, Nixon, New Jersey

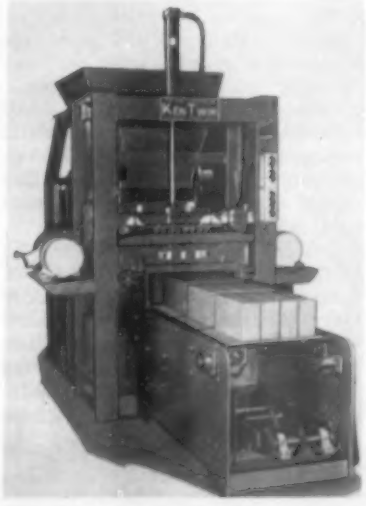
Fork Lift Truck

AMERICAN TRACTOR CORP., Churubusco, (Ft. Wayne), Ind., has brought out the M-3 TerraTrac crawler-mounted fork lift truck. It has a capacity of 3500 lb., and is available in three heights: 9 ft.; 12 ft. 6 in.; and 14 ft. 3 in., plus an extension which increases the lifting height to 21 ft. A tubular steel overhead guard protects the operator from falling objects, without obstructing his vision. Hydraulic tilt cylinders are mounted on top of the cab to increase the stability of the mast on high lifts. Other attachments available, in addition to the standard materials handling forks, are a concrete and mortar bucket, a ¾-cu. yd. loading bucket, and a 5 ft. 4-in. angling dozer blade. A 5-ton capacity tilt-loading trailer, to facilitate moving between jobs, is also available. Mounted on long, wide tracks, and powered by a 42.5-hp. Continental Red Seal engine, the unit is said to operate in mud, rough terrain and steep grades. Various types of track shoes, including rubber pads for operating on paved surfaces, open conduits, etc., are available.

Batch Lift

L. BURMEISTER CO., 4535 W. Mitchell St., Milwaukee, Wis., has introduced the WeighMeister batch lift,

featuring a screw-action lift, low bin, automatic batcher and automatic electro-pneumatic push-button controls. The batcher is power-fed by the screw lift, which is said to provide an accurately controlled stream of well-divided material and eliminate "slugs." The unit is completely self-contained, and has its own compressor for actuating the automatic controls. In batching, one man directs the flow of material with three push-buttons above the scale beam. Batching and bulk truck unloading may go on independently of each other. In bulk truck unloading, the feeder brings material from the ground-level feeder hopper to the vertical screw lift which augers material to the batcher. When the weight is reached, surplus material is automatically diverted to the storage bin. When no bulk truck is unloading, the feeder is supplied by gravity from the storage bin. Controls may be set to divert surplus back to the bin or to stop the screws automatically. It is available with either an electric motor or gasoline engine, truck or track-site receiver, and 225- or 300-bbl. bin.



Automatic Front Pallet Return

KENT MACHINE CO., Cuyahoga Falls, Ohio, has introduced an automatic front pallet return for installation on the KenTwin concrete block machine. The complete unit is about 8 in. wider than the pallet being fed, and extends approximately 5 ft. in front of the machine. The dimensions are almost the same as those of the original take-off table, and the pallet return can be built to fit pallet sizes down to an 18 x 18 in. The unit is driven by a hydraulic cylinder inside the machine, and the sequence of the machine cycle remains basically the same. It has no extra motors or controls.

PRE-MIX OPERATORS

...now you can handle jobs

MANY MILES AWAY

6 AGITATOR

6 AGITATOR

DEMAND THE BADGE OF DEPENDABILITY

...with the new super Hi-Lo agitator

CONCRETE TRANSPORT MIXER CO.

Made by the makers of the famous ROCKET Revolving Drum Truck Mixer

How many jobs have *you* missed—jobs just a little out of reach of your non-agitating equipment? Or how many times have you arrived on the job with a soupy, segregated mix? With the new, 6¼ cu. yd. *super Hi-Lo* agitator, you can make hauls that once were far out of range. Condition the mix as you go along—it's the same high quality when you pour as it is when it left your plant mixer.

Hi-Lo is probably the *least* expensive machine of its kind on the market. But more important, it is one of the least expensive machines to operate.

You see, the super Hi-Lo has a lot of sensible features that reduce maintenance, increase operating efficiency: Wide open top, replaceable liners of abrasion resisting steel, 180° swing chute with extension, sliding gate (no seal to replace), non-leaking, self-tightening packing glands, power takeoff, drive, replaceable blades and many others.

If you'll take a couple of minutes and send us the coupon, we'll show you how the new super Hi-Lo can be the key to higher profits for you!

MAIL THIS COUPON TODAY!

CONCRETE TRANSPORT MIXER CO.

4987 Fyler Ave., St. Louis 9, Mo.

FLanders 2-7800

Gentlemen: Please rush full information, prices and terms on the following:

- ☐ New Super Hi-Lo Agitator (Model 625)
- ☐ Batching Equipment ☐ Water Meters
- ☐ Hi-Lo Stationary Drum Truck Mixers
- ☐ New Rocket Revolving Drum Truck Mixers
- ☐ Material Handling Equipment

CP

Name_____

Firm_____

Address_____

City_____ State_____

COMMENT
from the
BUTLER ENGINEER

On ancient history . . . and planning big futures

Interesting historical items: in Baltimore a Butler customer doing an excavating job opened up a perfect maze of old tunnels. No one seems to know when they were built or what for . . . And in constructing the new Brooklyn Dry Dock they ran into a slew of mahogany logs 50 to 60 feet under water. They're estimated to be 70 or 80 years old. Don't ask me how they got there.

•

Despite this country's enormous productivity we still build too small. We're still plagued with steel and cement shortages . . . our new hospitals are overcrowded almost as soon as they're built. New schools? Same thing. New airports? Same thing. Moral: Don't let it happen to you when you build your Ready Mix Plant. Don't approach the problem with "Can we do with smaller equipment?" Look ahead. Analyze your market today and for the years to come. And even then "up" your thinking!

Expansion of an existing plant is expensive. Build your "expansion" in at the start.

Another good reason for building big: it keeps out competition. A prospective competitor looks over your market, sees your plant and says, "These boys must really dominate this area. Look at the size of their plant. We'd better not try to buck them!"

That's not theory, it's fact. Many of our customers have given actual case histories.

•

Here's something else that pays off handsomely: call in the Butler Engineer early in your planning for a Ready Mix or Concrete Products Plant. Give him time to study and plan. It will pay.

Now I'll get off the pulpit.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

TWO-WAY RADIO

(Continued from page 160)

ing floor. This device records orders simultaneously in both places. Interdepartment communication to all parts of the plant and yards is provided by a loud speaker system.

Batching Plant

Coral rock aggregate quarried in the county is delivered by dump truck to a hopper below a ramp. The truck hopper feeds the aggregate to an 18-in. Barber-Greene belt conveyor, 207 ft. centers, with a rise of 65 ft. to the batching tower.

Bulk cement from plants of Lehigh Portland Cement Co., General Portland Cement Co., Penn-Dixie Cement Corp., and Ponce Cement Corp. of Puerto Rico is delivered either in bulk railway cars or trucks. A screw conveyor takes the cement from an under-track hopper to a bucket elevator which empties into a 400-bbl. Butler storage bin.

Two 2½-cu. yd. paddle-type mixers made by Concrete Transport Mixer Co. are operated in the batching tower. Darex is used as an air-entraining agent in about 90 percent of the concrete delivered. The product is sold on a strength specification basis, the most common requirement being 3000 p.s.i. at 28 days.

Two 2-in. Neptune water meters and a moisture meter designed in the company's machine shop are used in each plant. All maintenance operations, including motor work as well as welding and painting, are performed in the company shop.

A substantial portion of the production of the Hollywood plant is being used on construction work at the five million dollar South Florida Mental Hospital which will require more than 12,000 cu. yd. of concrete.

Safety is an important consideration in the company's plan of operation. According to Gary Marable, general manager, emphasis on accident prevention has paid substantial dividends in reduced liability insurance premiums on trucks and cars. Safety meetings are held monthly at the plant and every third month a safety dinner is given for the operating personnel.

Employes at both plants are covered by a hospitalization insurance plan paid for entirely by the company. Employes are also protected by a company financed life insurance program.

The Ready-Mix Concrete Co. is popularizing its product by various forms of advertising. Sizeable advertisements in daily newspapers are used every week, copy being alternated between morning and evening newspapers. The company has sponsored a daily 5-min. weather forecast program on television for alternate 13-week periods and football games on radio. Painted billboards are used at strategic head-on locations. Souvenirs such as pencils, measuring tape, estimating rules and drinking cups for men on jobs in the field, call attention to the company's product and service.

The mixer trucks, which are attractively painted in red and green, are washed after each day's run and lined up in the yards. As the Ft. Lauderdale plant is close to a main highway, floodlights illuminate the plant after dark. A large neon sign surmounts the 65-ft. batching tower. During the holiday season a Christmas tree in colored lights is mounted on top of plant.

Officers and management personnel of the Ready-Mix Concrete Co., Inc. include Jay W. Birdwell, president; Gary Marable, who is vice-president as well as general manager; William Harper, assistant manager; Steven Brown, controller and Lawrence Ross, plant superintendent.

Employes of the company at one of the company-sponsored get-together dinners

PRESTRESSED CONCRETE OFFICE BUILDING

MULTIPLE STORY - CONTINUOUS DESIGN

Office building for United States Fidelity and Guaranty Company, Richmond, Va. . . . Architect, J. Henley Walker, Jr.; Structural Engineer, Wm. J. Blanton; Prestressed members by Concrete Structures Incorporated; General Contractor, Daniels Construction Company, all of Richmond.

COMPLETELY PRECAST and finished months ahead of the best estimated schedule for other materials, this structure cost the owner only $1.62 per square foot per floor level in place.

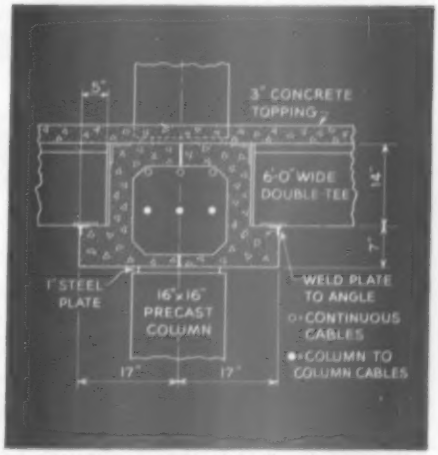
Precast reinforced columns, 32′ on centers, have steel plates welded to girder plates creating a rigid frame.

Hollow girders, precast in halves and assembled into 32′-long members post-tensioned with three cables before erection, have three additional continuous cables added after erection. Hollow was filled with grout after tensioning. Cables are Freyssinet type, each composed of eighteen 0.196″ diameter Roebling prestressed concrete wires.

Each 6′-wide double tee floor section, supported on girders 33′-4″ on centers, is stressed with sixteen ⅜″ diameter Roebling uncoated 7-wire stress-relieved prestressed concrete strands, pretensioned and bonded. Roof double tees have twelve ⅜″ strands.

All precast concrete is 6000 psi ultimate.

Roebling engineers will be glad to give you full information on tensioning materials and fabrication methods. In addition, they are ready to cooperate with you to help attain top efficiency on any given application of this modern and economical structural material. Contact Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.



Details at ground and 1st floor levels. Roof members are similar but have less prestress.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

Minimum of Maintenance

Low in price

Over 50 units sold in New Jersey this year

Especially adapted to unloading under severe and uneven ground conditions.

Unnecessary to narrow down the size of your cubes—Will handle cubes which are six blocks deep. (12 blocks across width of body.)

Versatile—Will slide off many other bldg. materials ie. Brick—with or without pallets; any pallitized material etc; with the addition of side boards, cinders, sand, gravel etc; may be dumped.

BLOCK

UNLOADER*

FOR DETAILS AND PRICES, WRITE OR PHONE

ADAM BLACK AND SONS, INC.

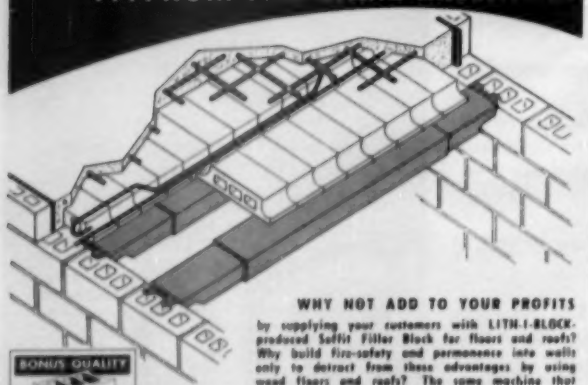
300 Tonnele Ave. Jersey City, N.J.

Journal Square 2-2120

COMMERCIAL BODY BUILDERS SINCE 1886

*** Patents and Patents Pending.**

LITH-I-BLOCK FOR WALLS SOFFIT BLOCK FOR FLOORS ...FROM THE SAME MACHINE!



BONUS QUALITY
LITH-I-BLOCK
MADE ONLY ON THE LITH-I-BLOCK MACHINE

WHY NOT ADD TO YOUR PROFITS

by supplying your customers with LITH-I-BLOCK-produced Soffit Filler Block for floors and roofs? Why build fire-safety and permanence into walls only to detract from these advantages by using wood floors and roofs? The same machine that produces Bonus Quality LITH-I-BLOCK for permanent fire-safe walls of outstanding beauty also produces Soffit Filler Block with the same inherent qualities. Get in on this profitable market — sell fire-safe roofs and floors as well as walls!

ACROW FLOOR CENTERS SIMPLIFY CONSTRUCTION

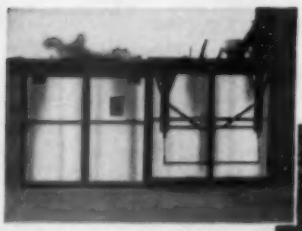
Rigid telescopic units adjustable from 4' to 15' provide temporary support for Soffit blocks — completely eliminate the usual maze of timber shoring. Simple retractable bearer plates permit fast, easy placement and removal by unskilled labor.

WRITE FOR DETAILED INFORMATION.

LITH-I-BAR CO. HOLLAND MICHIGAN

ONE PIECE OF EQUIPMENT OR A COMPLETE PLANT LAYOUT

SAVE FUEL • REDUCE CURING TIME CUT COSTS • UP PROFITS with *Standard* KILN DOORS!

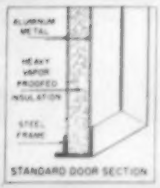


WHERE AISLE SPACE IS LIMITED STANDARD sliding doors need no aisle space. The carrier-type door (shown) requires 15" minimum clearance above top of door opening. A vertical sliding door, counterweighted for easy opening, is also available.

WHERE HINGE-TYPE DOORS ARE PREFERRED Choose from two STANDARD hinge-type doors. The top-hinging door (shown) can be used when there's insufficient room at sides of door. The conventional side-hinging door has rugged hinges and positive-seal lock.

CHECK THESE FEATURES

- √ **Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.**
- √ **Rugged Steel Frame.**



STANDARD DOOR SECTION

Get the Best — Send for Details Now

STANDARD DRY KILN COMPANY

798 S. HARDING ST. . . . INDIANAPOLIS 21, IND.

Porous Concrete Products

By F. O. Anderegg

IN ADDITION to those described in the June 1954 issue of ROCK PRODUCTS, some information has come to hand concerning Durox, which has been manufactured in Skovde, Sweden, since 1924 from spent oil shale and quick lime. Three plants in France are now using fly ash. One in Denmark is using ground sand.

The densities range from 3.0 to 50 p.c.f., and the insulating K factors are said to vary from 0.7 to about 1.0 B.T.U. inch/ft.²/in. deg. F. The claim is made that it is cheaper to build houses of Durox than of either brick or wood, the chief saving being in the labor department.

South Carolina Association

SOUTH CAROLINA CONCRETE MASONRY ASSOCIATION was recently formed at Columbia, S. C., as a non-profit organization to promote improved quality of concrete masonry in the state, as well as improved service. The association is comprised of approximately 25 member companies from South Carolina. Sam Breen of Rock Hill Concrete Co., was elected president; H. L. Saltonstall, Tidewater Concrete Pipe and Block Co., vice-president; and W. A. Foster of Palmetto Quarries Co., secretary-treasurer. These officers, with Roy Pennell, Jr., of Spartanburg Concrete Co. and H. A. McGee of Farmers Concrete Co., will form the board of directors.

Plastic Silo Roof Cap

MARIETTA CONCRETE CORP., Marietta, Ohio, is building concrete farm silos with translucent plastic roof caps for silo domes. The cap, called "Silo Lite," permits light to enter the silo for a well-lighted storage and working area, while keeping out the elements. Constructed of fiberglas - reinforced Plaskon polyester resin, a product of Barrett Div., Allied Chemical & Dye Corp., the cap is said to be unaffected by the weather. Hocking Plastics Co., Carbon Hill, Ohio, manufactured the dome cap to Marietta's standards of translucency and strength. The cap can be used in place of existing dome caps on older silos, as well as on the new models.

New Block Plant

THE WEST LIBERTY BLOCK & SUPPLY CO., West Liberty, Ky., has opened a new block plant having a daily capacity of 2400 block. Owners are W. Major Gardner, Reed Halsey, and Ormond Lewis. Monroe Collins is manager. Five men operate the plant.

YOUR OPPORTUNITY!

UNUSED Army Trucks
2½-TON
INTERNATIONAL and GMC 6x6's

- From Government Storage!
- Unused and Guaranteed!
- Factory-New Condition!
- Delivered on Approval!
- Reconditioned Trucks Also Available!

Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

For Specifications, Prices, Delivery:
Phone Collect
MILTON Y. TOOMBS, Jr.
Sales Manager

MEMPHIS EQUIPMENT Company
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
766 SO. THIRD ST. MEMPHIS, TENNESSEE

Build Better Masonry Walls FASTER!

TIME MEANS MONEY
Dur-O-wal handles fast on the job . . . assures neat, tight mortar joints because the slim, high tensile steel rods are butt welded in a single plane.

BACKBONE OF STEEL FOR EVERY MASONRY WALL, genuine Dur-O-wal assures a job of lasting quality at minimum cost. This time and laboratory tested reinforcing member handles easily, works fast, lays flat. Insist on Dur-O-wal for speed, economy, and convenience. You will like the tight neat mortar joints when you use Dur-O-wal to reinforce block, brick, or tile. The improved deformed side rods assure maximum bond strength. Available everywhere. Choose Dur-O-wal today.

Butt Weld
DUR-O-WAL
with TRUSSED Cross

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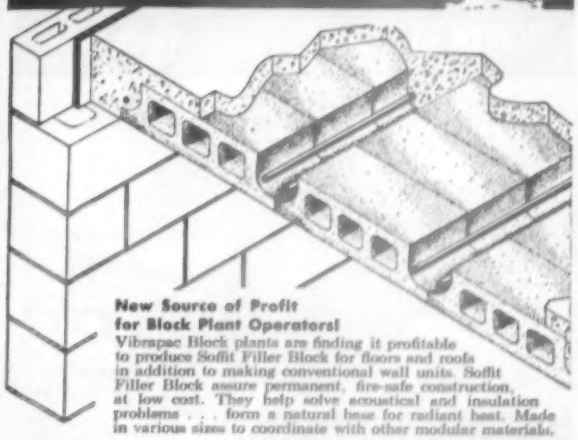
Dur-O-wal Products, Inc.
P. O. Box 628
TOLEDO 5, OHIO
Dur-O-wal Inc., 165 Utah St.
BIRMINGHAM 7, ALA.
Dur-O-wal Products of Ala. Inc. P. O. Box 5446
PHOENIX, ARIZONA
Dur-O-wal Division, Frontier Manufacturing Co.
P. O. Box 49
CEDAR RAPIDS, IOWA
Dur-O-wal Division, Dept. 656
Cedar Rapids Block Co.

Give them BOTH-
VIBRAPAC Block for Walls
SOFFIT Block for Floors

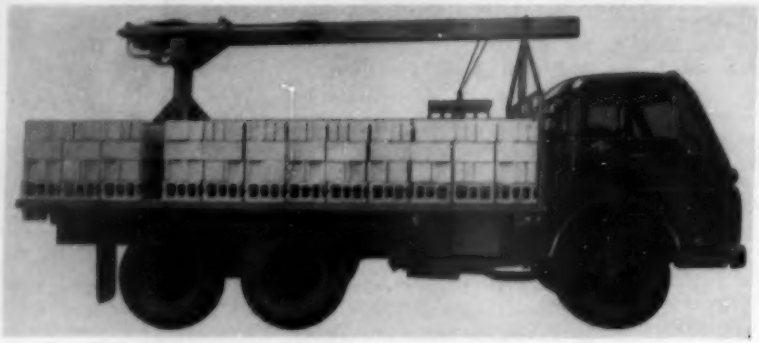


New Source of Profit for Block Plant Operators!
Vibrapac Block plants are finding it profitable to produce Soffit Filler Block for floors and roofs in addition to making conventional wall units. Soffit Filler Block assure permanent, fire-safe construction, at low cost. They help solve acoustical and insulation problems . . . form a natural base for radiant heat. Made in various sizes to coordinate with other modular materials.

VIBRAPACS are Versatile!
All types and sizes of block, as well as Soffit Floor Filler Block, are made on a Besser Vibrapac, using the same set of Plain Pallets. Fully automatic. No machine operator is required. Write for literature.

BESSER COMPANY
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Block Plants

SIDE-O-MATIC



UNLOADS ON BOTH SIDES AND REAR

INTRODUCED AT CLEVELAND CONVENTION — ALREADY SOLD IN NINE STATES

PARTIAL LIST OF SATISFIED USERS:

Raymond W. Bartlett
West Creek, New Jersey

City Cement Blocks Company
Bridgeport, Connecticut (2 units)

Nitterhouse Concrete Products
Chambersburg, Pennsylvania

Alico Concrete Products Company, Inc.
Patchogue, Long Island, New York

Maule Industries, Inc.
Miami, Florida

Concrete Masonry Corporation
Elyria, Ohio (2 units)

Binkley and Ober, Inc.
East Petersburg, Pennsylvania

Plasticrete Corporation
New Haven, Conn.

South Hammond Concrete Products Company
Hammond, Indiana

Apex Coal and Supply Company
Cleveland, Ohio

Marquart Concrete Block Company
Waterloo, Iowa

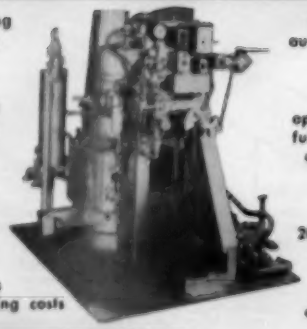
The Michigan Silo Company
Peoria, Illinois

Ideal Builders Supply & Fuel Co.
Cleveland, Ohio

SIDE-O-MATIC UNLOADER CORP.

P. O. Box 1561, York, Pa. • Phone York 7357

Get
STEAM QUICK with "Kwik-Steam"
(IN 2 MINUTES)
for curing Blocks and Pipe
with the Littleford
"KWIK-STEAM" Vapor-Clarkson Generator



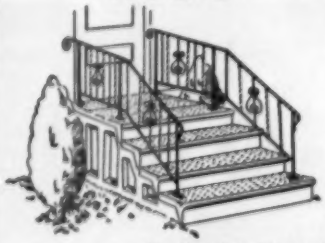
Modulating controls
fully automatic
steam where you want it
operates at full or half capacity
steam when you want it
sizes from 20 to 165 BHP
cuts manufacturing costs
speeds up curing cycle

You get steam in 2 minutes flat from a cold start with the Littleford "Kwik-Steam" Generators. And you save real money on concrete manufacturing costs, because the "Kwik-Steam" reduces labor costs 50% (no skilled labor required) and speeds up the curing cycle. There's a size for your plant. Send for descriptive bulletin.

Send for Bulletin EE-22

LB LITTLEFORD
LITTLEFORD BROS., INC.
400 E. Pearl St., Cincinnati 2, Ohio

NOW MORE THAN 150 LICENSED MANUFACTURERS Producing



Patented
homeward®
Concrete STEPS
A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

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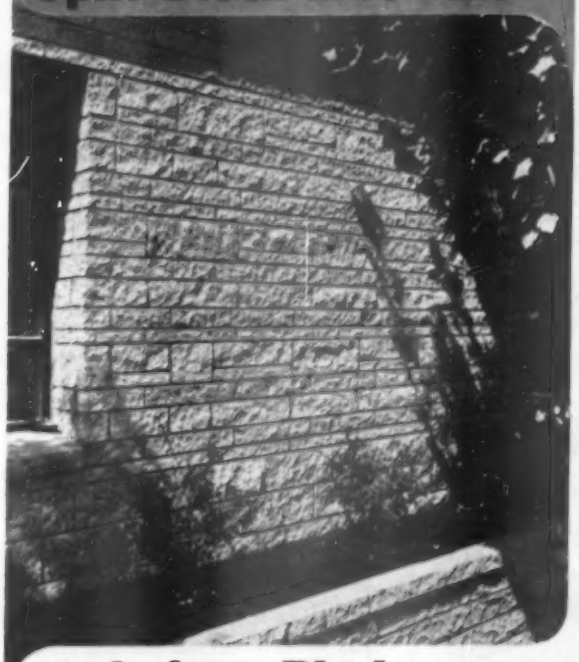
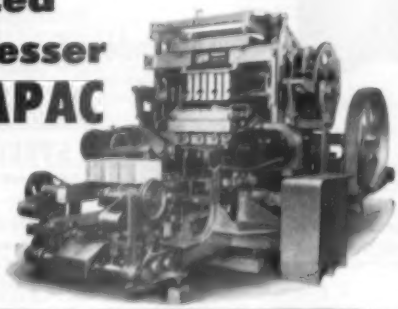
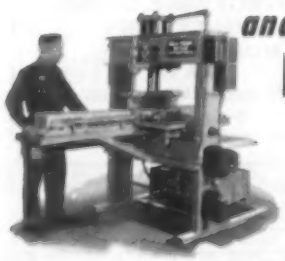
CONCRETE BURIAL VAULTS
AMERICA'S FINEST MOLDS AND LOWERING DEVICES
TERRITORY FRANCHISES
BERG VAULT SYSTEM
BERG VAULT CO.
BOURBONNET DIVISION
1000 LUCAS HUNT RD. ST. LOUIS 21, MO.

Give Customers *Beautiful* Split Block Like This—



made from Block produced on a Besser VIBRAPAC





***and* Split on a BES-STONE Block Splitter**

Yes—split block *is* beautiful if it's made *right*, using a Besser Vibrapac and Bes-Stone Splitter—the combination that gives you NEW PROFIT OPPORTUNITIES plus SATISFIED CUSTOMERS. Get all the facts from your nearby Besser Representative, or write for literature to:

BESSER COMPANY

Complete Equipment for Concrete Block Plants

ALPENA, MICHIGAN, U.S.A.

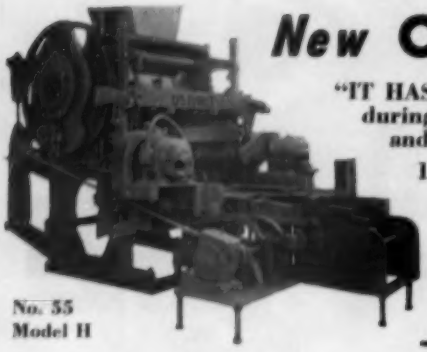
PORTLAND CEMENT

a new company keeping pace with industry

TORONTO: 1901 STAR BUILDING TEL. EMpire 4-2816

HEAD OFFICE: VILLENEUVE, QUEBEC TEL. MOntcalm 3-7831

Now . . . INCREASE PRODUCTION WITHOUT SACRIFICE OF QUALITY



No. 55
Model H

New OSWALT BLOCK MACHINE

"IT HAS EVERYTHING" which has been developed by Oswalt engineers during 35 years' experience serving block making plants. More power and stability, advanced design and latest operating features, including:

1. Shock-free Block Ejector
2. Front-end Pallet Feeder
3. Improved vibration and speed-up
4. Visual panel control system

Write for our new Bulletin, showing details of construction — *Ask for name of Oswalt-serviced plant nearest you*

OSWALT ENGINEERING SERVICE CORP.
1335 Circle Ave. • Forest Park, Ill.
Phones: Estebrook 8-4664 • FOrest 6-2798

WHERE TO BUY

WANTED

Plain Pallet—High Production Block Machine. Complete with pallets, mixer and skip. Equipment, though used, must be in very good condition otherwise will not consider.

If you plan to discontinue business or retire and want to sell, or lease, your entire block producing equipment, write me today. I have a fifteen year supply of cinders and want to set up complete equipment by January 1956.

BOX N-89, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

SILENT VIBRATING TABLES FOR CONCRETE PRODUCTS

ALSO, METAL MOLDS FOR SPLASH BLOCKS, STEPPING STONES, CHIMNEY CAPS, and "IDEAL" Combination Step Molds
For Details R. L. SPILLMAN CO.
Write to: 18 W. Morrill, Columbus, Ohio

COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:
Landers-Segal Color Co.
78 Delavan St. • Brooklyn 31, N. Y.

PLAIN STEEL PALLETS

Guaranteed Quality
Flat • Square • Accurate
GARY STEEL SUPPLY COMPANY
2300 S. Springfield Avenue, Chicago 23, Ill.
CRawford 7-2525

FOR SALE

1 Multico Type #2 (2 years old).
1 30 Foot Mixer.
1 Electric Off-bearer.
50 Racks—#72 block type.
1800 Pallets ⅛ x 18 x 18.
1 8x8x16 Mold, complete with all fractionals.
1 4x8x16 Mold, complete with all fractionals.
1 12 x 8 x 16 Mold, complete with all fractionals.
1 Brick mold.
1 Slab mold measuring 2⅝"x8x16 also, 3x8x16.

PRICE: $10,000 terms
This equipment can be seen in operation
VIBRATED CONCRETE CO.
DENVER, COLORADO

GOOD WILL BUILDERS

Your contractor and bricklayer customers will be able to do quicker, easier, straighter work with UB Tools . . . tools that carry YOUR OWN COMPANY ADVERTISING. Linestretchers, Corner Ties, Line Pins, Twigs, Concrete Calculators. We also wholesale a complete line of Bricklayers' Tools. Write for literature and prices.

UNITED BUILDERS
1822 Lindberg Dr., Muskegon, Mich.

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS

made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

Small Block Plant Owner

I have quite a supply of used machines that are replaced by larger plants who need larger production. Some of these setups are in very good condition. As they are a surplus to me, I will sell on any reasonable terms with payments as low as $50.00 a month.

Mid-Western Concrete Equipment Co.
Box 646 Mukwonago, Wis.

COLOR YOUR CONCRETE!
SMITHKO
LIMEPROOF CONCENTRATED DRY COLORS
Write for samples and brochure, "Getting Results With Color in Concrete and Cement Products"
SMITH CHEMICAL & COLOR CO.
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FOR SALE

5,000 Piano Steel Pallets—5/16" x 18 ½" x 20" at $1.25 each.
F. O. B. Dearborn, Michigan
JOHN A. MERCIER BRICK CO.
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FOR SALE

Stearns 42 c.f. batch mixer new main bearings and pinion bearings, new shell liners.

SMITHTOWN CONCRETE PRODUCTS CORP.
Box 612 Smithtown, N.Y.

ALSO SEE WHERE TO BUY ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

GERSON'S GOOD WILL BUILDERS

Advertising necessities for the block industry. Line Pins, Twigs, Corner Blocks, Calculators. Complete catalog on request.

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FOR SALE

#9 Joltcrete, complete with offbearer, turntables, and 80 steel racks, 72 block capacity. Also attachments & pallets for 4, 6, 8, 10, 12"; 8x8 & 8x12 chimney blocks. This equipment is in excellent running condition, producing 4000 8" equivalents per 9 hr. day, & can be seen in operation until December 1, 1955.

Ideal Concrete Products & Fuel Co., Inc.
P.O. Box No. 2 South Beloit, Ill.

FOR SALE

Fork and platform power lift trucks, used and guaranteed factory rebuilts.

ERICKSON POWER LIFT TRUCKS, INC.
Saint Anthony Blvd. & University Ave. N.E.
MINNEAPOLIS 18, MINNESOTA
Phone—Sterling 1-9508

2-7' x 72' Diameter Autoclaves

150 lb. Pressure quick opening doors on both ends. Autoclaves could be cut in half and made into four autoclaves of desired length with door on one end.

Priced for quick sale. Inquire—

Anchor Concrete Products, Inc.
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Grant N. Rainhold Humboldt 3152

1—Multico three block plain pallet block machine with air off bearer and attachments for making 2-3-4-6-8-10-12" blocks with bull nose, corner and half block, brick and chimney. No reasonable offer refused.

Have installed larger machine.

Concrete Products & Supply Co.
Box 389 Fremont, Ohio

NEED PORTLAND CEMENT?

Standard, High Early, and White conforming with A.S.T.M specifications available in carload and chip-load quantities. Our monthly tonnage allocation is offered to you subject to prior sale and final commitment from mill. For samples, specifications, and prices contact Behmpo and Lyons, 6823 W. Commerce St., Tel. General 20661, San Antonio, Texas, U.S. Sales representatives for Tolteca Portland Cement Co., S.A. Mexico City. Largest and most modern plant in the Republic, in operation over 45 yrs., subsidiary of Associated Portland Cement Manufacturers, LTD., London, England.

KEEP ABREAST

WITH

INDUSTRY TRENDS

THROUGH

ROCK PRODUCTS

Ready Mix Concrete Plant For Sale

Serving large industrial area, no competition. Year round operation in Southwest. Includes General Contraction business, sand and rock plant, equipment rentals, machine shop. Old established business, possibilities unlimited. Annual business about $1,000,000.00. Owner will sell all or part interest with long time to pay to responsible party capable of managing the business.

BOX N-92, CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

No. 7 Joltcrete Machine

Excellent production machine complete with motors, plus 4", 6", 8" 10", 12" and chimney mold boxes. Plenty of steel pallets and racks. 18' mixer and skip. Yes a complete package to make a modern production plant. Can be seen in operation now. Will release complete setup in December at time of installing larger equipment. Plant equipment is priced right and is located in N.E. Pennsylvania. Inquire today.

BOX N-90, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

FOR SALE

Going Concrete Products plant. Equipped for making concrete stave silos, Building blocks and trim stone. Retail sewer pipe drain tile, steel and steel products.

60 ft. aggregate elevator, 75 yds. capacity elevator aggregate storage bins, 2 steam rooms and boiler large enough to heat building and furnish steam for steam room all automatically controlled

We also have following which we offer for sale.

1—New Monarch heavy duty stave machine.
1—Anchor tamper for same.
400 stave pallets, wood, steel covered.
18 steel stave racks, capacity 25 & 30 staves each.
1—pallet cleaner.
1—all steel silo staging with center pole 6" tubing, adjustable from 10' to 16' silo and 80 ft. in height.
1—electric stave hoist.
300 ft. heavy electric cable.
50 steel block racks, 50 block capacity.
1—2" Homelite pump.
1—1" centrifugal pump.
1—Wheel barrow scale.
75 universal form clamps.
100——Staple post mold forms.
4 pair block and tackle for ½ rope.
1 pair block and tackle for 1" rope.

GALIEN CONCRETE TILE CO.
P. O. Box 26 Phone 262 Galien, Mich.

FOR SALE

Two Ready-Mix concrete plants Located in Bristow and Stroud Oklahoma. Will sell Bristow plant separate.

Bristow Plant $20,000.00

Bristow and Stroud Plants $55,000.00

THE EVANS LUMBER CO.
STROUD, OKLAHOMA

FOR SALE

No. 7 Joltcrete Block Machine complete with motor, etc. 4", 6", 8" and 12" molds. Offbearer. Turntable. Pallets. Reason for selling, installing larger equipment.

C. L. DEFFENBAUGH
R. D. No. 1, Coshocton, Ohio

FOR SALE

Ready-Mix Concrete Plants, have two to offer, Missouri towns, one 25,000, other 10,000. Modern throughout. Doing excellent business. Owner retiring.

J. L. McHUGH CO., INC.
Long Bldg. Kansas City, Mo.

WANTED

Attachment for making brick to fit a Besser K3 Stripper block manufacturing machine.

CONCRETE PRODUCTS
BOX N-68
309 W. Jackson Blvd. Chicago, Ill.

FOR SALE

Appley-Tollen Semi-Automatic Block Machine, Skip—Mixer—Motors and Compressor—Pallet Oiler—Hydraulic Lift Truck—75 Steel Racks—2000 Pallets 4", 8", 12". Equipment has only made approximately 500,000 blocks and is presently in operation and in excellent condition.

BOX N-72, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

WANTED

Packerhead concrete pipe machine to make through 12", 4' long both B&S and T&G and ASTM C-14 and C-76.

BOX N-82, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

CONCRETE PRODUCTS PLANT FOR SALE

In growing industrial city, surrounded by thriving farming area—Southeastern Mich. Modern plant that cost approximately $150,000.00. Will sell for about one half above amount. To responsible party only about $80,000.00 plus nominal working capital needed to swing transaction. Balance ten years. Personal reasons compel sale.

BOX N-74, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

FOR SALE
OR WILL CONSIDER PARTNERSHIP

New England Concrete Vault Plant Established over 20 yrs. Along with retail memorial business. Unusual opportunity for young man practical and experienced to also make septic tanks, concrete blocks, door steps, none of these manufactured within 50 miles. Present owner must eventually retire.

BOX N-91, CONCRETE PRODUCTS
309 W. Jackson Blvd. Chicago 6, Ill.

Are you getting ALL the Block Sales out of each job?

When a prospect decides to use concrete block for the foundation and exterior walls of his new house don't overlook your opportunity for **extra** sales. Many producers boost volume by promoting block for additional uses in home construction.

One architectural trend, for example, is the use of concrete masonry for interior walls and partitions. Showing prospects how such walls add real beauty and charm to houses can add to your profits.

The growing popularity of concrete block joist floors affords another opportunity to build sales. Every prospect is interested in floors that can't squeak, sag or burn.

There's rustic charm in a concrete masonry fireplace. Like all block construction it can be painted any of a variety of attractive colors with portland cement paint.

Concrete masonry garages offer another market for your block. They are weather-resistant yet economical to build and often provide space for a workshop or storage room.

Also, extra sales await the producer who points out the many advantages of concrete block for:

Garden Walls • Outdoor Barbecues • Terrace Walls
Back-up for other Masonry Materials

Write for free literature on these or other uses for concrete masonry, sent only in U.S. and Canada.

PORTLAND CEMENT ASSOCIATION
Dept. A11-45, 33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

INDEX TO ADVERTISERS IN THE CONCRETE PRODUCTS SECTION OF ROCK PRODUCTS

SEE INDEX OF ROCK PRODUCTS SECTION ADVERTISERS ON PAGES 191, 192

Anchor Concrete Products, Inc. 181

Barber-Greene Co. 147
Berg Vault Co. 178
Bergen Machine & Tool Co., Inc. 144
Besser Company 155, 170, 177, 179
Black, Adam, & Sons, Inc. 176
Blaw-Knox Company 148
Blue Ridge Talc Co., Inc. 180
Butler Bin Company 174

Cedar Rapids Block Co. 177
Colorado Fuel & Iron Corp. 175
Columbia Machine 183
Concrete Products & Supply Co. 181
Concrete Transport Mixer Co. 173

Davis, Frank D., Co. 172
Deffenbaugh, C. L. 181
Dunn, W. E., Mfg. Co. 159
Dur-O-wal Products 177

Edick Laboratories 168
Erickson Power Lift Trucks, Inc. 181
Essick Manufacturing Co. 145
Evans Lumber Co. 181

Florida Division 157
Food Machinery & Chemical Corp. 157
Frontier Mfg. Co. 177

Galien Concrete Tile Co. 181
Gary Steel Supply Co. 180
Gerson Company 181

Ideal Concrete Products & Fuel Co., Inc. 181

Johnson, C. S., Co. 162, 163

Kent Machine Co. 172
Kirk & Blum Mfg. Co. 168
Koehring Company 162, 163

Landers Segal Color Co. 180
Lith-I-Bar Co. 176
Littleford Bros., Inc. 178

McHugh, J. L., Co., Inc. 181
Memphis Equipment Co. 177
Mercier, John A., Brick Co. 180
Mid-Western Concrete Equipment Co. 180
Motorola Communications & Electronics, Inc. 146

National Conveyor & Supply Co. 164

Oswalt Engineering Service Corp. 180

Portland Cement Association 182

Quinn Wire & Iron Works 165

Roebling's, John A., Sons Corp. 175

St. Lawrence Cement Co. 179
Schield Bantam Co. 169
Schwope & Lyons 181
Side-O-Matic Unloader Corp. 178
Smith Chemical & Color Co. 180
Smith, T. L., Co. 145
Smithtown Concrete Products Corp. 180
Spillman, R. L., Co. 180
Standard Dry Kiln Co. 176
Stearns Manufacturing Co., Inc. 167, 184

United Builders 180
United States Steel Corp. 142
Universal Atlas Cement Co. 142

Vibrated Concrete Co. 180

Willard Concrete Machinery Sales Co. 165
Williams, C. K., & Co. 171
Williams, Roger F. 178

THE NAME THAT'S...

GROWING!

Today...industry's acceptance of Columbia's 12"-HIGH is greater than ever...because:

IT INSURES YOUR BUSINESS FUTURE

With a 12"-HIGH, you can keep your initial investment low by buying standard 4" and 8" molds, knowing that *at any time in the future* you can get into 12"-HIGH production and still keep your standard block output. The 12"-HIGH accommodates both standard plain 18 x 20 and 18½ x 26-inch pallets.

IT'S IDEAL FOR LARGE PLANTS

The Columbia 12"-HIGH, teamed with standard Columbia block machines, gives the plant owner a full range of specialty products along with continuous output of standard block. The 12"-HIGH also doubles in brass on standard types to provide peak production in emergencies. And it requires minimum floor space.

IT'S IDEAL FOR MEDIUM AND SMALL PLANTS

Since the 12"-HIGH makes all standard block as well as special 12"-HIGH shapes, it is a complete production unit in itself. That's why it's called the "one-machine block p[lant]

IT HAS BEEN PROVED, TESTED AND ENDORSED

The Columbia 12"-HIGH underwent more than two years of intensive development and testing before being placed on the market in January, 1954. Since then, scores of operators have given it a rigorous workout in actual production of [roof] tile, water meter boxes, silo staves and other special shapes, as well as regular 4", 6" and 8"-high [blocks].

Write, wire or phone today for full information on the unique Columbia 12"-HIGH and other Columbia equipment for concrete block plants.

The Columbia 12"-HIGH, above, has the same rugged construction and operating features as the great Model 8 and Model 12 Columbia standard block machines.

District Offices in: Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, Massachusetts, Montreal, Que. and Vancouver, B. C.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse: Mattoon, Illinois

Owners say...

THE STEARNS BIG 3*

(SERIES 50 BLOCK MACHINES)

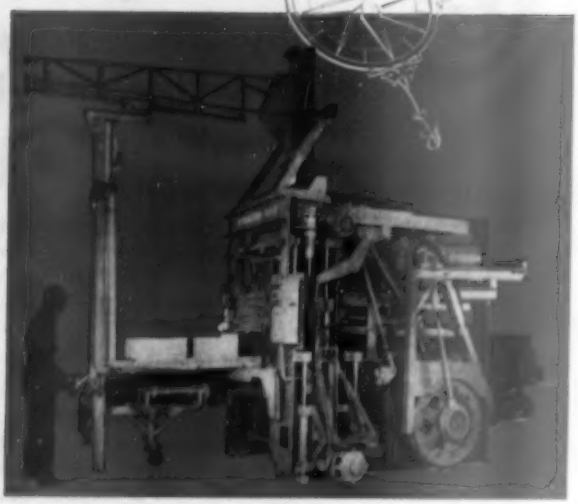
REMOVE ALL DOUBT!

. . . for

✓ **DEPENDABILITY**

✓ **TOP PRODUCTION, QUALITY UNITS**

✓ **LOWEST UPKEEP**



The following excerpts were taken from letters from enthusiastic owners of Stearns Series 50 block machines. (The Big 3)*

. . . "Amazed at the high productivity of perfect units."

. . . "The high production of excellent block, more than justified the small additional cost."

. . . "Blocks superior to any we have ever seen."

. . . "We investigated *all* makes and chose the Model 50-3*."

. . . "During 15 years, we have operated six makes of machines, now the answer is simple, a Stearns 50-1*."

. . . "Lowest labor and upkeep cost in our history."

. . . "To anyone considering a new machine, we urge them to see the Stearns Model 50-1* in operation first!"

. . . "The Stearns 50-3* spells *profit* in any man's language."

. . . "We have had many machines since 1907, and the Stearns 50-3* offers the most in block machines today."

. . . "Our sales are the highest in our history, and our bouquets go to our dependable Stearns 50-2* which made it possible. It's no problem to sell block on quality and precision now."

ASK ANY OWNER!

*** THE BIG 3**

Model 50-3 makes three 8" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 26".

Model 50-2 makes two 10" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 20½".

Model 50-1 makes two 8" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 18½".

WE'LL SEE YOU AT THE TEXAS AND SOUTHEASTERN REGIONAL MEETING, N.C.M.A. SHAMROCK HOTEL HOUSTON, TEXAS NOVEMBER 21-23

STEARNS

MANUFACTURING COMPANY · INC.

ADRIAN • MICHIGAN

COMPLETE CONCRETE PRODUCTS PLANT EQUIPMENT

ECONOMICAL TO BUY • PROFITABLE TO OWN

DESIGNERS and BUILDERS of EQUIPMENT for BASIC INDUSTRIES

NiHard

McNally Pittsburg NiHard iron is used for long wear service in slurry pumps and valves. NiHard parts are cast and ground to close limits, to your specifications. For NiHard cast iron parts, write to McNally Pittsburg.

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PLANTS: Pittsburg, Kansas — Wellston, Ohio

Rotary

DRYERS
COOLERS
KILNS

Increase the capacity and efficiency of your plant

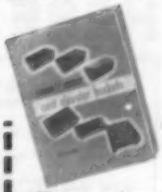
McDERMOTT BROS. CO.
THIRD AND WASHINGTON STS.
ALLENTOWN, PENNA.
Established 1895

to low-cost bucket elevator service

HERE'S why Link-Belt Cast Buckets will pay off in longer life, better handling. These rugged buckets have uniform sections and smooth surfaces, thanks to special casting techniques. Their corners, lips, ends, and backs are reinforced for maximum rigidity.

Get all the facts on Link-Belt's broad line of cast buckets for both belt and chain. Book 2465 gives full ordering information. All styles are available in malleable iron or Promal and can be made of aluminum or bronze. See your nearest Link-Belt office or distributor.

LINK-BELT
CAST ELEVATOR BUCKETS



CLIP THIS COUPON AND MAIL TODAY

LINK-BELT COMPANY
220 S. Belmont Ave., Indianapolis 6, Ind.
(Or Your Nearest Link-Belt Office)

Please send me immediately a copy of Book 2465, "Link-Belt Cast Elevator Buckets."

Name_____
Position_____
Firm_____
Address_____
City_____ Zn___ State_____

4 REASONS WHY S-A 745 CARRIERS ARE BEST

1. **SPUN END, ONE PIECE ROLLERS** . . . consisting of carrying surface and ends spun from a single piece of heavy gauge steel tubing plus an inner bearing tube welded to spun ends. Standard carrier, 4" diam., 5" diam. also available.
2. **PERMANENTLY SEALED** . . . precision ball bearings are protected by a die-cast double labyrinth seal which will not corrode or wear, insuring protection of bearings from dirt and moisture.
3. **PRE-LUBRICATED** . . . sufficient grease is sealed into each roller to last the normal life of the carrier—Alemite fittings also provide for easy re-lubrication.
4. **INTERCHANGEABLE ROLLERS** . . . pre-adjusted 4" diameter rollers slide easily in or out of the box-slots in the supporting brackets without tools.

Drawing shows spun end roller construction, die-cast labyrinth seals and precision ball bearings in position.

IN STOCK FOR IMMEDIATE DELIVERY!

WRITE FOR CATALOG 554

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
7 Ridgeway Ave. Aurora, Illinois

I'M SOLD ON Kleenslot

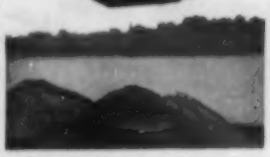
WEDGE WIRE SCREEN GUARDS

They're Rugged, Dependable, and give Long Life Performance

The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. This item can be furnished in special sizes to your requirements in practically any type of long wearing metal.

Complete literature is available. These screen guards are non-clogging, non-blinding, and are strong, rigid, uniform and extremely economical.

Wedge-Wire CORPORATION
GAS STREET AT NICKLE PLATE R. R. WELLINGTON, OHIO



STANDS UP TO SEVERE USE *and even abuse*

One word describes a Hayward —*ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N. Y.

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CLAM SHELL · ELECTRIC · ORANGE PEEL · GRAPPLES
famous for performance since 1888

Slurries... *handled at lower cost*

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

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Denver, Colo., U.S.A.
New York Office: 1775 Broadway, N.Y.C.

Buy WILFLEY for Cost-Saving Performance

WILFLEY centrifugal PUMPS

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JAW CRUSHERS

60" x 48" to 6" x 3"
New and used RELIABLE

"Farrel-Bacon" Jaw Crushers

BACON-PIETSCH CO., INC.
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Phone Montclair 3-5618

JAW CRUSHER

Good Roads Model 20-F Champion 24" x 50" opening. Manganese jaw plates. Good condition. Dismantled. Will sell at reasonable price.

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2817 East 99th Street
Chicago 17, Ill.

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1—Link Belt Speeder ½ yd. Dragline, Model 50.
1—Northwest Shovel, ½ yd., Model 20.
1—D8 Bulldozer Cable Control Blade.
1—40 Cat Bulldozer, Angle Blade.

Sheridan-Marquette Welding Service
800 W. Marquette St. Ottawa, Ill.

FOR SALE

Jeffrey 24" x 30" Hammermill, purchased 1949. Type RS. Excellent condition. Used only as standby unit, now surplus. Price: $1350.00 F.O.B. Denver.

The Robinson Brick & Tile Co.
500 S. Santa Fe Drive Denver 23, Colo.
Phone: Sherman 4-3371

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Dixie 26" x 50" Hammermill.
Hardinge 10' x 48" Ball Mill, 400 HP.
Patterson 6' x 8' Ball Mills (3 avail.)
Kennedy Type M 5' x 8' Ball Mill.
Raymond #1 Pulverizer.
Pacific 8" x 15" Jaw Crusher.
Bartlett & Snow 14" x 16" 2 roll, spiked.

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Allis Chalmers—4 x 12, 3 x 12 lowhead.
Tyler 4 x 7 with thermionic unit.
Tyler—5 x 12, 3 x 10 wet type.
Link-Belt 3 x 8 double deck.
Robinson Gyro Sifter 28A.

Kilns—Coolers—Dryers

10' x 200' x 8½" comb. chamber.
8' x 125' x 5/8 firing hood.
7' x 110' x 9/16" brick lined.
6' x 74' x ½" with lifters.
5' x 67' x 5/16" with lifters.
5' x 40' x 5/8" with lifters.
8' x 16' x ½" brick lined, oil fired.

Link-Belt Roto Louvres

310-12 with heating coils, cyclone.
502-20 with furnace, collector and fans.
604-24 with furnace or heating coils.
705-20 Stainless contact parts, complete.

Compressors

1800 CFM 100 PSI 300 HP Bury.
327 CFM 100 PSI 60 HP, I.R. Imperial X.
215 CFM 75 PSI HP, I.R.
30 CFM 30 PSI Fuller C11.

Air-Classifiers

Gayco, 8'-5'-18" all with motor drives.

Deep Well Pump

6000 GPM Peerless 80' TDH, 150 HP.

HEAT & POWER CO., INC.

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Murray Hill 7-5280
Machinery and Equipment Merchants

LOCOMOTIVE: 8 ton, 36" gauge, gasoline.

BALL MILLS: 2—5 ft. by 22 ft.

PAN FEEDERS: 1—Manganese Pan Feeder, heavy duty, 60"x15 ft. with 20 H.P., 220/440 volt motor, speed reducer, V-belt drive. Condition like new. 1—Link Belt heavy duty ore or Rock Feeder, 36"x10 ft., 5 H.P. motor, speed reducer and drive. 1—Apron Pan Feeder 42" wide, 110 ft., 75 FPM, lift 20 ft., 100 H.P., 220/440 volt motor, Jones Speed Reducer, 61 H.P., ratio 20.7, with structural support.

REDUCTION CRUSHERS: Allis Chalmers R548 Hydrocone, with large stock new parts. Condition like new. Will sell parts separately. Symons 2 ft. Cone Crusher, standard, with 25 H.P. motor and drive.

JAW CRUSHERS: Allis Chalmers 18x30" sectionalized for underground use, V-belt, 50 H.P., 220/440 volt motor, new condition. Also, 48 x 60", 42 x 40", 36 x 48", with or without motors and drives. Other sizes from 4" x 6" to 48" x 60".

SHOVEL FRONT for Bucyrus Erie 54-B, 2½ yd. NEW condition.

OVERHEAD ELECTRIC CRANES: 1-10 ton, 84' span, 4 motor, bucket operating, 440 volt, AC, cab control. Other cranes AC and DC 5 ton to 150 ton.

LOCOMOTIVE CRANE: 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

MINE HOISTS: Single and double drum, 100 to 1500 H.P., with all elec. equip. Complete specs., drawings, photos available.

HOIST MOTORS:

300 H.P., 435 RPM.	600 H.P., 716 RPM.
400 H.P., 580 RPM	1200 H.P., 444 RPM.

2300 volt, A.C. with controls.

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NEW BONDED® HEAVY DUTY VIBRATING SCREENS

"For Continuous, Economical Screening of High Tonnages"

More than 5000 mines and quarries have modernized with Bonded equipment

Model Number	No. of Decks	Screening Area	Sale Price
133BS	1	3'x8'	$1119.00
238BS	2	3'x8'	1165.00
338BS	3	3'x8'	1250.00
248BS	2	4'x8'	1695.00
348BS	3	4'x8'	1850.00
2410BS	2	4'x10'	1775.00
3410BS	3	4'x10'	2095.00
3412BS	3	4'x12'	2395.00

Model Number	No. of Decks	Screening Area	Sale Price
124AS	1	2'x4'	$355.00
224AS	2	2'x4'	375.00
126AS	1	2'x6'	375.00
226AS	2	2'x6'	395.00
136AS	1	3'x6'	495.00
236AS	2	3'x6'	585.00
336AS	3	3'x6'	815.00
138AS	1	3'x8'	575.00
238AS	2	3'x8'	695.00
338AS	3	3'x8'	845.00

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.
HEAVY DUTY MODELS: type BS 4-bearing, positive throw, eccentric shaft; 3'x8' to 5' x 14', 1 to 5 decks.
GENERAL DUTY MODELS: type AS eccentric weight mechanism, spring mounted, 1 to 3 decks, 2'x4' to 3'x8'.

Heavy Duty Screens from $1119.00 — **General Duty Screens from $355.00**

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

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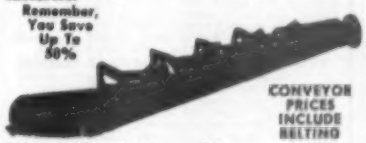
Remember, You Save Up To 50%



CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$ 1166.	$ 672.
14"	50'	2016.	1884.
16"	20'	1070.	592.
16"	45'	1928.	1012.
16"	60'	2494.	1264.
16"	85'	3350.	1683.
18"	25'	1327.	739.
18"	45'	1986.	1065.
18"	60'	2575.	1354.
18"	85'	3466.	1798.
18"	100'	4000.	2065.
20"	25'	1366.	770.
20"	45'	2122.	1145.
20"	60'	2689.	1426.
24"	25'	1428.	835.
24"	45'	2227.	1237.
24"	60'	2826.	1549.
24"	100'	4425.	2339.
24"	136'	5624.	2995.
30"	25'	1535.	915.
30"	65'	3349.	1856.
30"	85'	4029.	2316.

Other lengths & belt widths at bargain prices.

NEW BONDED® FEEDERS

Capacities to 225 tons per hour.
Priced from $280.00

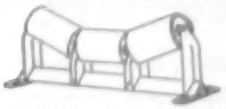
NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

Width	List Price	Sale Price
14"	$ 3.43 foot	$ 2.75 foot
16"	3.86 foot	3.85 foot
18"	4.27 foot	3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.86 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for

14" belt	$ 17.25	24" belt	$ 19.75
16" belt	18.00	30" belt	20.50
18" belt	19.00	36" belt	21.25
20" belt	19.25	42" belt	23.75

1-roll, 5" diameter Return Idlers for

14" belt	$ 6.75	24" belt	$ 8.00
16" belt	7.00	30" belt	8.75
18" belt	7.50	36" belt	9.25
20" belt	7.75	42" belt	10.75

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Maintenance is negligible.

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Cedarapids 3240 primary crusher. New Condition.
Cedarapids 4033 hammermill secondary unit.
Cedarapids 2023 hammermill.
Cedarapids 42" x 10' feeder.
Williams 20" pulverizer.
Cedarapids 2020 double impeller breaker.
10 x 7 Allis-Chalmers Blake type jaw crusher. Rebuilt.
Austin-Western 15x24 jaw.
Cedarapids 4' x 12' double deck screen.
Niagara 3' x 12' triple deck screen.
Cedarapids 3' x 8' double deck screen.
15 cu. yd. Cedarapids sand drag. New.
New 12" x 36' inclined open elevator.
60-ton, 2-comp., 8' x 13' storage bin with clam gates.
Special bins to your specifications.
Conveyors—18"-24"-36"-36". Also belting.
18" dia. x 20" face magnetic pulley.

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Lorain 520, 2-yd. diesel shovel, crane, drag.
Brownhoist 1-yd. gas shovel-crane.
Lorain MC-414 20-ton truck crane.
Lorain MC-254-W crane.
Lorain Model 30, ½-yd. crawler shovel-clam.
Unit Model 614 diesel backhoe.

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8—Euclid rear dumps, 22 ton. Good condition.
3—Cat DW10 scrapers. Very good condition.
1—Allis-Chalmers HD-19 crawler with Carco blade.
1—Int. TD-18 with Bucyrus-Erie bulldozer blade.
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1—Woolridge 15-18 yd. Model TCR scraper.
3—Woolridge 14 cu. yd. Terracobras, Cummins engines.

DIESEL POWER UNITS

Caterpillar D7700, 63 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D13000 6-cyl. diesel engine, Twin Disc clutch, extended shaft, outboard bearing, 145 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D17000 8-cyl. diesel engine with Twin Disc clutch, 190 H.P. @ 1000 RPM.
GMC 6-71 diesel engine radiator to and including clutch, 130 HP @ 1400 RPM. constant duty, electric starting equipment. New condition.
GMC 12-cyl. twin diesel engine complete from radiator to and including automotive type clutch with gear reduction unit, fabricated base, electric starting system, 200 H.P. @ 1200 RPM. New Condition.

ASPHALT PLANT

Barber-Greene Model 548 with drier, graduation unit, etc.

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500 Cu. ft. Gardner-Denver diesel, rebuilt.
365 Cu. ft. Gardner-Denver diesel, rebuilt.

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Bay City 6G Shovel-Backhoe-Crane, 1¼ yd. Diesel.
N-W 80-D 2¼ yd. Dragline. Diesel. 100' boom.
N-W Model 6, 1½ yd. Diesel Shovel.
Northwest 50-D Diesel Shovel 2½ yd. New 1952.
Lorain L-520 2-yd. Shovel-Drag-Crane 100' bm.
Lima 1201, 2½ yd. Diesel Shovel.
Manitowoc 3E-10, 2½ yd. High Lift Shovel.
Buc-Erie 84-B Diesel Shovel, 2½ yd.
Manitowoc 3500 Dragline, 140' boom, new 1950.
Northwest 25 Diesel, ¾ yd. Shovel.
Lima 604 Backhoe-Crane-Drag. Cat. D13000 Diesel.
Lima 604 Drag. Diesel, 65' bm; New 1954.
N-W 95, Drag. New 1951. Murphy Diesel 80' bm.
N-W 6, Crane-Drag. New 1951. Murphy Diesel
Koehring 605 Shovel-Crane-Dragline Cat. D13000

CRUSHERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 15x33, 20x40, Eagle 20x36, Diamond 24x36", Cedar Rapids 10x20, 20x36, 25x40, Farrell 10x36, 12x30, 14x36, 15x36, 36x48, Buchanan 8Sx42, Good Roads Reliance 15x30, Traylor 15x36, 24x36, Allis-Chalmers 30x18. Good Roads 10x30, Telsmith 18x32, Traylor 42x60, 42x48, Allis-Chalmers 42x60.
GYRATORY: Allis-Chalmers-McCully, 6", 7½", 8", 9", 12K, 20", 30", 42", 14" Newhouse, 24", 30", Gyrasphere, 10" 25" Intercone Telsmith, Telsmith BH, 10-B, 12-B, 14-B, Kennedy Van Saun 7, 10, 25½-S, 37, Traylor Ty 1'6", Ty 2'4", T-4½'.
ROLL: Cedar Rapids 40x20, Poineer 40x22, Pioneer 30x18, Telsmith 24x16, Pioneer 30"x18", New Holland 24x16, Pioneer triple 40"x22" A-C 42"x16".
HAMMERMILL: Size 4 Williams Jumbo, Pennsylvania SX2, 20x22, Cedar Rapids 20x30, Jeffrey 30x42, 36x24, 36x40, Penn SXH-100, Cedar Rapids 30x28.
BALL MILL: Hardinge 10'x48", K.V.S. 6'x8' Type M Air Swept J-H 6'x8', Hardinge Conical 6'x22", Colorado Iron Works 5'x6'; Marcy No. 64½, Hardinge conical 10'x24".
ROD MILL: Marcy 2'x8', 3'x8'. Allis-Chalmers 4'x8', Hardinge No. H 296. Marcy 5'x12'. Hardinge 6'x22".
CONE: Symons 2' and 3' coarse bowl.
KILNS: 6'x42', 5'x30', 6'x50'6", 6'6"x45', 7'x110' 10'6"x160'.
DRIERS: Vulcan 4½x50', others 7'x20', 6'x80', 7'x70', 8'x40' and Cedar Rapids 60"x24'.

CRUSHING PLANTS

Cedar Rapids "Pitmaster" port. washing-screening.
Cedar Rapids Portable Super Tandem, excellent.
Austin Western port. Model 101. New 1953.
Pioneer 305W, crushing, washing, screening.
Cedar Rapids 40x22 Port. Secondary, Diesel.
Universal Model 500 Port. Gravel Plant.
Pioneer Port. 11x36 jaw, 40x20 rolls.
Telsmith Sand-Gravel-Screening, large capacity.
Cedar Rapids 4033 hammermill, complete, excellent.
Diamond 66, Port. Prim. 1036. Secondary 3018.

LOADERS

B-G 82A, Hough Payloaders, 1½, 1¼, ¾ yds.
AC Model HD-15 3 yd. bucket. Elmco 21 Rocker.
Euclid MDL.10-YBX Cummins NHH Diesel.

CONCRETE PLANTS AND EQUIPMENT

Johnson concrete plant 352 yds. 5 aggr. compt.
Cement silos, Corps of Engr. Spec.
Johnson concrete plant 200 yds. Corps Engr. Spec.
5 aggr. compts. cement silo 2706 bbls.
Erie Strayer Port. Complete 30-40 yds. hr.
Johnson 200 yd. 4 aggr. compt. 200 bbl. cement compt. 1032 bbl. silo.
B-K 400 bbl. cement bin, 400 bbl. silo.
Heltzel 100 ton 3 compartment aggr. bin.
Butler 212 cu. yd. 6 compts. Complete.
Smith 56-S 2 yd. tilting mixer, 30 HP elec. motor.
Cement Unloading System, with 1750 bbl. silo.

SAND AND GRAVEL HYDRAULIC DREDGES

10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted, Complete.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6".
8" Hydraulic. Diesel. On 32'x8' steel pontoons.
Ameco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
6" H-P twin Diesel drive. Complete.

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American 20 ton Guy Derrick 100' boom, 110' mast.
American Terry 20 ton Guy Derrick, 100' boom.
Guy Derrick, 15 tons, 115' mast, 100' boom.
American 25 ton stiff leg derrick, 80' boom.
Special 35 ton stiff leg derrick, 100' boom.
Nat'l Bridge 20 ton Guy Derrick, 100'.
American 30 ton stiff leg, 100' boom.

SCREENS

Telsmith heavy duty washer 60"x18'.
Simplicity 4'x10' four deck.
Symons 4'x14' double deck.
Tyler 4'x10' two deck heavy duty, motor, Gen. Set.
Telsmith 5'x12' dbl. deck elec. motor.
Cedar Rapids 4'x12' dbl. deck elec. motor.
Pioneer 4'x12' 2½ deck elec. motor.
Pulsator 4'x8' four deck.
Acme 5'x24' Rotary Scalper elec. motor.

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1—Lorain model 280 shovel serial 16017 powered by a Waukesha model WAKD diesel engine serial #707466 with gas starting engine. 23' shovel boom 18' dipper stick 2 cu. yd. Amsco bucket. Overall length of crawler 15'6". Overall width of crawler 11'4", 34" treads. Machine operated approximately 700 hours since complete overhaul.

MICHIGAN SILICA CO., Rockwood, Mich.

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TD9 International Drott Loader with ripper. Bought new June 1, 1953. Practically new. Price $8,500.00.

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1—11' x 330', ¾" shell.
1—11' x 10' x 235', ¾" shell.
2—8' x 125', ¾" shell.
1—7'6" x 110', ¾" shell.
1—7'6" x 7' x 125', ½" shell.
1—7'5" x 20' Link Belt, Roto-Louvre.
1—6'x40', ⅝" shell.
1—6' x 24' Link Belt, Roto-Louvre
1—5' x 67', 5/16" shell.
1—5' x 40', ⅜" shell.
1—5' x 30', 7/16" shell.
1—4'6" x 50', ⅜" shell.

CRUSHERS—PULVERIZERS—MILLS

2—Allis Chalmers 10" Superior McCully.
1—Allis Chalmers k-9 Gates Gyratory.
10—Jaw Crushers 5"x6" to 42"x48".
3—Symons Cone 4', 3', 2'.
1—Raymond 4 Roll Low Side Mill.
2—Pennsylvania #5XR-100, 100 TPH.
3—Hardinge 5'x22", 6'x22", 10'x48".
3—Patterson 6'x8' Ball Mills.
1—Raymond #40 Imp.
1—Williams #20 H.D. Slugger Hammermill.
2—A.C. 6'x22' Tube Mills, 300 HP motors.
1—Allis Chalmers #8722 Compeb Mill.

SCREENS—SEPARATORS

6—Tyler Hummer Screens 3'x5', 4'x5', 4'x7'.
1—Link Belt 3'x8' double deck Screen.
5—Rotex 40"x84", 40"x120".
4—Air Separators 6', 8', 10', 14'.

MISCELLANEOUS

2—Chicago 14"x7" Compressors, 434 cfm.
2—Oliver Rotary Dewaterers 8'x4'.
12—Bucket Elevators 20' to 75' centers.
250 ft. Link Belt 12" Troughing Conveyor.
800 ft. 30" Troughing Conveyor.
1—10,500 gpm Centrifugal Pump 135' head.

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1—Allis-Chalmers 8'x7'x22' two compartment mill and motor.
2—New 6½' x 150' Kilns.
1—Complete Lime Hydrating Plant.
1—6 Williams Jumbo hammermill.

KILNS

1—4' x 40', 9' x 120', Kilns.

DRYERS

1—4½' x 30', 6' x 60', 8' x 125'.

CRUSHERS

1—48" x 60", 36" x 42", 30" x 36", 24" x 36", 18" x 36", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls.
1—48" Telsmith Gyrasphere crusher.
36" x 16 rebuilt Sturtavant rolls.
2—24" x 14" Rogers Iron Works Crushing Rolls, Rebuilt.
1—24" x 12" Farrell Bacon Crushing Rolls.
1—Sturtevant #2 duplex ring roll mill.
1—6", 10", 16" and 20" McCully Superior Gyratory Crushers.
No. 3 up to No. 12 Gyratory Crushers.

BALL, ROD & TUBE MILLS

1—7'x8', 6'x12', 5½'x10', 8'x6' Ball Mills.
3—5'x16'; 1—6½'x10' Rod Mills.
3—6½'x20', 5'x22', 46'x22' Tube Mills.
3—6'x22' Compeb Mills—6'x22' Tube Mills.
1—10'x48" Hardinge Mills.
3—3-Roll Bradley Hercules Mills. Direct Connected to 300 HP Motors.

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1—14' or 6' Air Separators.
1—6'x4', 12'x10' Oliver Filters.

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Lima 2400 4 yd. high lift shovel
Marion 111-M 4 yd. standard diesel shovel
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618 Page diesel walker 5 yd. 125' boom
7400 Marion electric walker 8 yd., 200' boom.
9-W B-E electric walker 8 yd., 200' boom
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3500 Manitowoc 2½ yd. 85' drag
95 Northwest 2½ yd. 70' diesel dragline
955 P & H 85' boom, 2½ yd. diesel dragline.
2000 Manitowoc 1½ yd. diesel shovel
K-480 Link Belt 80' 2 yd. diesel crane-drag, independent boom hoist
604 Lima 65' boom 1½ yd. diesel dragline
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A complete inventory of rebuilt Clamshell Buckets, both material handling and digging buckets, sizes from ⅛ yd. to 2-yd. capacity, all makes.
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4—INGERSOLL-RAND AIR COMPRESSORS, portable, 500 cu. ft., gas and diesel. Good cond. Cheap.
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20" & 30" Superior McCully Gyratory.
24" x 36" & 48" x 60" Traylor Bulldog Jaw.
1—54" x 24" Pioneer Crushing Rolls.
222R Allis Chalmers Hydro Cone.
42 x 16, 36 x 16 & 30 x 16 Crushing Rolls.
36 x 24 Jeffrey B 75 hp, 440 V. Hammermill.

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15 Ton Diesel 60' Boom Whirley Crane.
3—65 & 44 Ton G.E. Diesel Elec. Locomotives.
10 Ton Plymouth Diesel Locomotive.
100, 35 & 25 Ton G.E. Diesel Elec. Locomotive.
25 Ton Amer. Diesel Loco. Crane. 50' Boom.

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1 Williams 4 Roll High Side Pulverizer.
12 Rod Mills 30" x 54", 4' x 14', 5' x 10', & 6' x 12' Denver, Marcy & A.C.
45 Ball Mills: 3'x4', 3'x7', 4'x5', 5'x8', 5'x10', 5'x18', 6'x5', 6'x8', 6'x10', 6'x9', 7'x5', 7'x6', 7'x7', & 3 Marcy 86.
29—Hardinge Mills: 10'x48", 8'x18", 8'x36", 8'x22", 7'x36", 6'x36", 6'x22", 6'x14", 5'x36", 5'x 24".

20E CLYDE WHIRLEY CRANE
1—45 Ton 130' Boom Electric. 2 yrs. old.

ROTARY KILNS
19—4'x28', 6'x28', 7'x110' & 9'x125'.

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3'x26', 4'x20', 5'x35', Single Shell.

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INDEX TO WHERE TO BUY

Bacon-Pietsch Co., Inc. 186
Becker Coal Co. 189
Bonded Scale & Machine Co. 187
Bridgeboro Lime & Stone Co. 190
Brill Equipment Co. 188

Corson, G. & W. H., Inc. 191

Dalton Supply Co. 189
Darien Corp. 189

Equipment Corporation of America 189

Fehrs Tractor & Equipment Co. 189
Flynn Machinery Co. 189
Forbes Motor Co. 188
Fort Worth Sand & Gravel Co. 190
Foster, L. B., Co., Inc. 189
Frank, M. K. 190

General Engines Co., Inc. 189

Heat & Power Co., Inc. 187
Heidenreich, E. Lee, Jr. 191
Heineken, W. P., Inc. 188
Helms, Robert O. 188
Hoffstetter, George 189

Illinois Slag & Ballast Co. 186

McLeod, Alex T. 190
Michigan Silica Co. 188
Mid Continent Equipment Co. 190
Mississippi Valley Equipment Co. 191

Nussbaum Electric Co. 190

Oakes, G. E. 190
O'Neill, A. J. 187

Pennsylvania Drilling Co. 190
Perry Equipment Corporation 190

Robinson Brick & Tile Co. 186

Sheridan-Marquette Welding Service 186
Smith, H. Y., Co. 190
Smith, L. B., Inc. 188
Stein Equipment Co. 190
Stuntz-Yeoman Co. 191
Swabb, Frank, Equipment Co., Inc. 189

Testa Brothers, Inc. 191
Thomasville Drilling & Testing Co. 190
Tractor & Equipment Co. 190
Troyer, Stanley B., Equipment Co. 191

Unverzagt, G. A., & Sons, Inc. 190

Walsh, Richard P., Co. 188
Weaver, George F. 189

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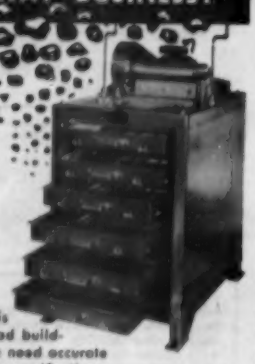

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INDEX TO DISPLAY ADVERTISERS

Allis-Chalmers Mfg. Co. 22, 41, 97, 102, 108, 109, 119
Allis-Chalmers Tractor Div. 16, 17, 129
American Brake Shoe Co. American Manganese Steel Div. 11, 125
American Pulverizer Co. 124
American Steel & Wire Div. 4, 5

Babcock & Wilcox Co. 121
Baldwin-Lima-Hamilton Corp. 31
Barber-Greene Co. 10, 147
Berg Vault Co. 178
Bergen Machine & Tool Co., Inc. 144
Besser Company 155, 170, 177, 179
Black, Adam, & Sons, Inc. 176
Black Brothers Co., Inc. 131
Blaw-Knox Company 148
Bradley Pulverizer Co. 137
Bucyrus-Erie Co. 27, 39
Buda Division 108, 109
Bunker Bin Company 174

Caterpillar Tractor Co. 6, 94, 95
Cedar Rapids Block Co. 177
Chevrolet Division 25
Chikaan Company 120
Clark Equipment Co. 133
Colorado Fuel and Iron Corp. 35, 54, 175
Columbia-Geneva Steel Div. 4, 5
Columbia Machine 183
Combustion Engineering, Inc. 140
Concrete Transport Mixer Co. 173
Cross Engineering Co. 139

Davis, Frank D., Co. 172
Dodge Trucks 32
Dorr-Oliver, Inc. 26
Dunn, W. E., Mfg. Co. 159
du Pont, E. I., de Nemours & Co., Inc. 38, 135
Dur-O-waL Products 177

Eagle Iron Works 48
Edick Laboratories 168
Ehrsam, J. B., & Sons Mfg. Co. 138
Essick Manufacturing Co. 145
Euclid Division 15

Falk Corporation 101
Firestone Tire & Rubber Co. 23
Florida Division 157
Food Machinery & Chemical Corp. 157
Frontier Mfg. Co. 177
Fuller Company 14

Gates Rubber Co. 8
General American Transportation Corp. .. 14
General Motors Corp. 15, 25
Gilson Screen Co. 192
Goodrich, B. F., Co. 3
Goodyear Tire & Rubber Co. .....Outside Back Cover
Gulf Oil Corp. 9

Hammermills, Inc. 24
Hammond Bag & Paper Co. 131
Haynes Stellite Co. 28
Hayward Co. 196
Hendrick Manufacturing Co. 137
Hewitt-Robins, Inc. 117
Hough, Frank G., Co. 123
Hyster Company 52

International Harvester Co. 12, 13, 123
Iowa Manufacturing Co. 45

Jaeger Machine Co. 29
Johnson, C. S., Co. 162, 163
Jones & Laughlin Steel Corp. 43

Kennedy-Van Saun Mfg. & Eng. Corp. ... 91
Kent Machine Co. 172
Kirk & Blum Mfg. Co. 166
Koehring Company 162, 163

LeTourneau-Westinghouse Co. 111, 113
Lima Shovels 31
Link Belt Company 1, 185
Lith-I-Bar Co. 176
Littleford Bros., Inc. 178
Ludlow-Saylor Wire Cloth Co. 21

Manhattan Rubber Div. 44
McDermott Bros., Co. 185
McNally Pittsburgh Mfg. Corp. 185
Meckum Engineering, Inc. 136
Memphis Equipment Co. 177
Merrick Scale Mfg. Co. 118
Mine & Smelter Supply Co. 130
Motorola Communications & Electronics, Inc. 146

Nagle Pumps, Inc. 134
National Conveyor & Supply Co. 164
National Ready Mixed Concrete Assn. 34
National Sand & Gravel Assn. 34
Nordberg Mfg. Co. 36, 37

Oswalt Engineering Service Corp. 180
Owen Bucket Co. 114

Page Engineering Co. 136
Patterson Foundry & Machine Co. 126
Pettibone Mulliken Corp. 24
Pfarrer, W. H., Co. 122
Pioneer Engineering Works, Inc. 104, 105
Poor & Company 104, 105
Portland Cement Association 182

Quinn Wire & Iron Works 165

Raybestos-Manhattan, Inc. 44
Raymond Bag Company 50
Raymond Division 140
Remington Arms Company, Inc. 135
Resisto-Loy Co., Inc. 138
Roebling's, John A., Sons Corp. 175
Rollway Bearing Co., Inc. 47
Ryerson, Joseph T., & Son, Inc. 192

St. Lawrence Cement Co. 179
Schield Bantam Co. 169
Screen Equipment Co., Inc. Inside Back Cover
Side-O-Matic Unloader Corp. 178
Simplicity Engineering Co. 122
Smidth, F. L., & Co. 18
Smith Engineering Works 46
Smith, T. L., Co. 145
Sprague & Henwood, Inc. 132
Standard Dry Kiln Co. 176
Standard Stamping & Perforating Co. 131
Stearns Manufacturing Co., Inc. 167, 184
Stephens-Adamson Mfg. Co. 186

Tennessee Coal & Iron Div. 4, 5
Texas Company 58
Thermoid Company 35
Thomas Foundries, Inc. 30
Torrington Company 42
Traylor Engineering & Mfg. Co. 7

Union Carbide & Carbon Corp. 28
United States Steel Corp. 4, 5, 142
Universal Engineering Corp. 24
Universal Atlas Cement Co. 142
Universal Vibrating Screen Co. 134

Wedge-Wire Corp. 186
Western Precipitation Corp. 127
Westinghouse Air Brake Co. 111, 113
White Motor Co. 40
Wickwire Rope 33
Willey, A. R., & Sons, Inc. 186
Willard Concrete Machinery Sales Co. 165
Williams, C. K., & Co. 171
Williams Patent Crusher & Pulverizer Co. .....Inside Front Cover
Williams, Roger F. 178
Wood, Charles E., Co. 139

Yuba Manufacturing Co. 128

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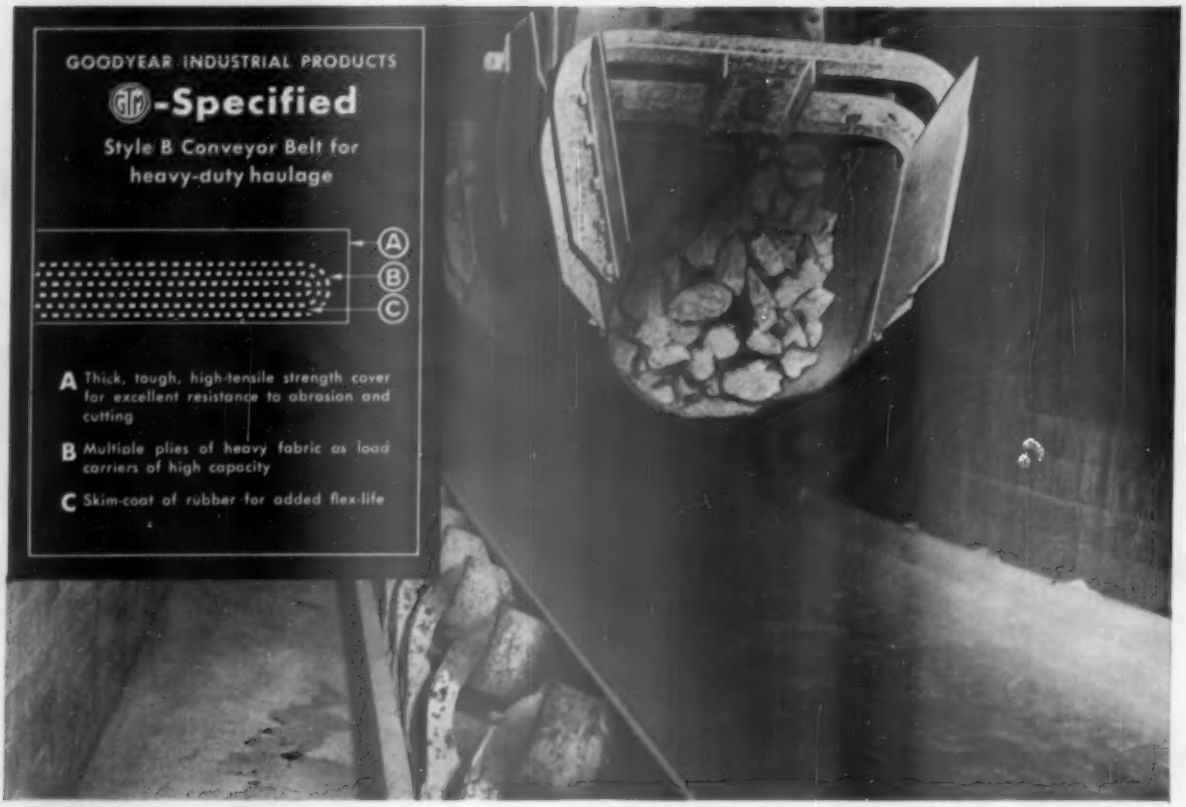
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A
B
C
A Thick, tough, high-tensile strength cover for excellent resistance to abrasion and cutting
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* * *

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